VEGETATION, FLORA AND SPECIAL FEATURES

OF THE

CANDIDATE GOOSE MOUNTAIN ECOLOGICAL RESERVE

Prepared by

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PLEASE NOTE

The views and recommendations expressed in this report are those of the consultants and not necessarily those of the department.

SUMMARY

This report provides baseline biophysical information to be used in the preparation of management plans for the 5780 ha candidate Goose Mountain Ecological Reserve.

Four biophysical map units and nine subunits, which can be reliably differentiated from air photo analysis, are recognized and their distribution in the study are mapped.

Thirteen vegetation types are recognized based on analysis of 90 vegetation plot descriptions. A comparison of these vegetation types with those described elsewhere in west-central Alberta by other authors suggests that the vegetation of the candidate reserve is more closely allied to subalpine than to boreal forest and foothills vegetation.

Thirty-three vascular plant species are found in the candidate reserve which elsewhere in Alberta are largely confined to moist and wet habitats in the mountains. Sixteen vascular plant species found in the candidate reserve are considered rare or uncommon in Alberta.

Aside from the entire Goose Mountain escarpment which is geomorphologically and floristically of provincial significance, eight special features of provincial or regional significance are mapped and described. Minor boundary changes to the Candidate Reserve are recommended to incorporate these features.

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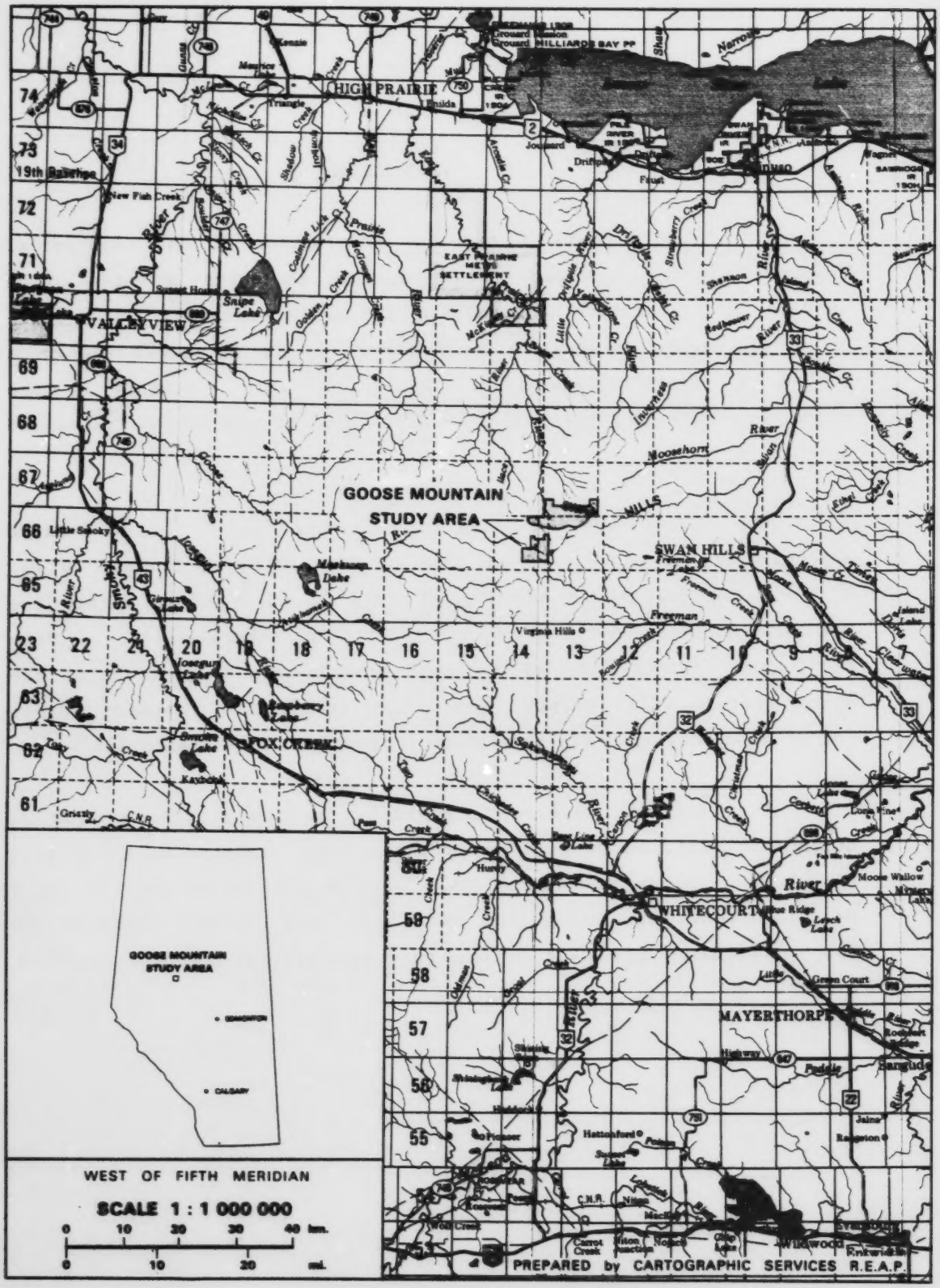
1. INTRODUCTION

This report provides baseline information on the biophysical resources of the candidate Goose Mountain Ecological Reserve to be used in the preparation of management plans for the area. Information on physiography, geology, climate and soils is largely based on a review of relevant literature. Extensive field inventory by the authors provides the basis for the discussion of vegetation, flora and special features.

The 5780 ha (22.5 mi^2) candidate reserve is located approximately 36 km west of the town of Swan Hills in Twp 67, Rg 13, W5, and Twp 66, Rg 13 and 14, W5 (Map 1). It occurs within the Northern Outliers Section of the Foothills Natural Region. This section is characterized by isolated erosion-remnant plateaux in the Boreal Forest which support vegetation transitional between Boreal Forest and Rocky Mountain vegetation (Cottonwood Consultants 1983).

The candidate reserve is divided into two blocks: a 3960 ha northern block dominated by the Goose Mountain escarpment, and a 1820 ha southern block containing the Goose River valley and a large patterned fen. The intervening ca. 1.5 km wide corridor contains the Goose Mountain Fire Tower access road and several large timber cut blocks.


GOOSE MOUNTAIN
STUDY AREA
HIGH PRAIRIE
VALLEYVIEW
SWAN HILLS
FOX CREEK
WHITECOURT
MAYERTHORPE
GOOSE MOUNTAIN
STUDY AREA
EDMONTON
CALGARY
WEST OF FIFTH MERIDIAN
SCALE 1 : 1 000 000
0 10 20 30 40 km.
0 10 20 mi.
PREPARED by CARTOGRAPHIC SERVICES R.E.A.P.

2. METHODS

Preliminary identification and mapping of biophysical map units and special features was undertaken through interpretation of 1:15000 black and white air photographs (1978).

Field work, designed to survey the full spectrum of vegetation types and special features, consisted of 24 man-days of reconnaisance and vegetation sampling in 1983. The reconnaisance field trip was conducted June 18-19. The main vegetation sampling was carried out July 16-23. A helicopter overflight on August 27 enabled identification of sites requiring further investigation which were subsequently surveyed on August 27-28.

In total, about 90 vegetation plots (20 m x 20 m) were described. Transects for sampling vegetation generally followed cutlines or trails which crossed major portions of the study area and cut through most of the biophysical units identified on the air photographs. Forays off these, however, were made to survey biophysical units and special features not accessible by cutline. Distinctive, homogeneous vegetation units along the transects were described, using the standard vegetation plot description form of the Natural Areas Program.

The total cover of each stratum and its component species were estimated. Two canopy strata were recognized in many old stands. The understorey of single-stemmed saplings and multi-stemmed tall shrubs included all individuals 2-5 m tall in height. Woody individuals between 0.5 and 2.0 m were assigned to the medium shrub stratum. Herbs

and shrubs under 0.5 dm were assigned to the low shrub/herb stratum, and non-vascular species of the forest floor were assigned to the bryoid stratum.

The 90 vegetation plot descriptions were grouped into 13 vegetation types, using the manual method of tabular comparison (Mueller-Dombois and Ellenberg, 1974: 175-210). Not all vegetation types can be differentiated on air photographs; therefore, map subunits and units are largely groupings of vegetation types found in similar geomorphic situations which could be mapped from air photographs.

Over 700 collections were made of vascular and non-vascular plants. Dr. D. Vitt and Mr. M. Ostafichuck (University of Alberta) identified the moss and lichen collections, respectively. Vascular plant identifications were made by the authors. Those of which the authors were uncertain were taken to Dr. J. Packer (University of Alberta) for verification. These are deposited at the University of Alberta herbarium.

Sites with unusual vegetation and geomorphic characteristics considered of provincial or regional significance were identified as special features and mapped.

3. PHYSIOGRAPHY AND DRAINAGE

Goose Mountain is part of the Swan Hills Upland, one of a set of rather flat-topped erosional remnants in northern Alberta which resisted Quarternary glaciation. The original plateau which extended in a southeast-northwest direction has been reduced through fluvial erosion to a series of elongated spur ridges. Goose Mountain lies at the western end of the most western spur, the highest point in the Swan Hills. The southern and eastern portions of the candidate reserve have gently rolling relief due to subhorizontal Tertiary gravel deposits and thin glacial till over gently dipping bedrock. The north-facing escarpment is hilly with pronounced gully development. This is due to abundant precipitation and the effects of runoff on the strongly sloped glacial erosion face of poorly consolidated bedrock. The escarpment grades into rolling country below (Lindsay, Wynnyk and Odynsky 1964; Jones 1962).

Small streams and large patterned fens in the centre of the study area contribute to the upper headwaters of both the Goose River which flows west to the Peace River, and the Freeman River which flows southeast to the Athabasca River. Seepage along the north escarpment contributes to the upper headwaters of East Prairie Creek, which flows north toward Lesser Slave Lake.

Elevations vary from 1402 m at the gentle summit of Goose Mountain to about 1050 m along the southern edge of the study area and roughly 1000 m below the north escarpment, where East Prairie Creek leaves the study area.

4. GEOLOGY

Goose Mountain is underlain by non-marine shales and sandstones of the Paskapoo Formation. These strata are over 300 m thick and are often poorly consolidated (Allan 1918). The formation outcrops along ridges created by gullying on the north escarpment and sporadically in valleys throughout the study area. Where weakly consolidated shales outcrop, the unstable slopes prevent vegetation establishment. Sandstone is more resistant and out crops form narrow, shallow ledges which rapidly weather to sand and moderately fine angular rubble. The sandstone outcrops support sparse assemblages of mesophytic and subxerophytic plants.

The Paskapoo Formation is capped by a discontinuous veneer (to 5 m thick) of water-worn quartzite gravel, which has been correlated with similar deposits in the Cypress and Hand hills (Allan 1918). This gravel veneer is composed of late Tertiary pebbles, cobbles and small boulders which originated as erosion products from the young Rocky Mountains. They were subsequently distributed by a massive network of shifting rivers which fanned across what is now western Alberta. The water-worn material was deposited in subhorizontal strata (Allan and Rutherford 1934). In the study area, Tertiary gravels on slopes not covered by glacial drift or thick soil create conditions unfavorable for deep rooting. These areas are few and small, and support unusual moss and lichen assemblages which grade into coniferous forest along their edges.

Allan (1918) concluded that the Swan Hills plateau was not glaciated. Lengelle (1976) disagrees, noting that large erratics occur at 4000 ft (roughly 1200 m) above sea level, but he does agree that the till is thin and mixed with the Tertiary gravels above 3500 ft (roughly 1050 m). As most of the study area lies above this elevation, the till is thin and was probably deposited under shallow ice in the study area appears to be permeable and favorable to plant growth.

Short, shallow meltwater channels occur at lower elevations in the southern block of the study area. Thin colluvial and alluvial deposits are found throughout the deeply dissected northern escarpment (St. Onge 1975; pers. obs.). Alluvial deposits are also found on the floodplain of the Goose River.

5. CLIMATE

Goose Mountain is characterized by a cool moist continental climate. Little is known about the winter climate, although Sacramento gauges at Goose Mountain Lookout and at a location 10 km east of the study area show mean October to May precipitation values equivalent to roughly 179 mm, (119 - 229 mm for the period 1979 - 1982, and 81 - 274 mm for the period 1977-1982, respectively) (Paul Jablonski, pers. com., Watershed Management, Forest Land Use Branch, Alberta Forest Service, Spring, 1983, memorandum).

More climatic data is available for the summer period (May to September) (Atmospheric Environment Service, Edmonton). Besides data from Goose Mountain (1402 m), two other stations are discussed here for purposes of comparison. Swan Dive is chosen to represent lower elevation (1272 m) areas of the Swan Hills. Valleyview (762 m) is chosen to represent the climate of the surrounding plains (but without the modifying influence of a large river valley as in the case of nearer low-elevation sites). Climatic data from each site is derived from at least 15 years of records.

Summer precipitation is high at Goose Mountain (mean monthly figures of 104 mm as opposed to 93 mm at Swan Dive and 60 mm at Valleyview). Precipitation totals are quite variable within short distances, as is evidenced by recent Sacramento gauge recordings at Goose Mountain Lookout and Goose Mountain Road locations, which are roughly 20 km apart (Paul Jablonskipers. com.). Such variation is attributed to orographic effects and airflow trajectories (Nemanishen and Meeres 1980). Mean precipitation at Goose Mountain Lookout peaks in June (146 mm). Mean June, July and August precipitation (126 mm) averages more than twice as much as mean May and September precipitation (61 mm).

The mean daily temperature from May to September is 9.1°C at Goose Mountain, 10.6°C at Swan Dive and 12.9°C at Valleyview.

6. SOILS

The imperfectly to well-drained soils of the study area form a continuum from Orthic Gray Luvisols through Podzolic Gray Luvisols to Humo-Ferric Podzols. The Luvisols tend to develop on thicker tills, while the Podzols are more extensive on thinner till. The distribution of this thhinner till coincides with moister mesoclimates at higher elevation (Lindsay, Wynnyk and Odynsky 1964). The trend toward intensified podzolization is generally considered to reflect increases in surface litter accumulation (as would be expected from moister mesoclimates) and lower concentrations of clay and exchangeable basic cations (probably due to the differences in parent material). The subsequent lower soil pH throughout the upper solum and the predominance of organo-metallic complexes rather than clays in the B horizon characterize podzols (Pedro, Jamagne and Begon 1978; McKeague, Ross and Gamble 1976). The tendency for podzolization may have implications for the prevalence of coniferous forests on these sites; however, this factor is probably outweighed by the overriding direct influence of the regional climate.

Organic soils (probably Fibrisols) dominate in poorly drained depressions, where moist conditions, low nutrient concentrations and cool climates favor the growth of sedges and peat mosses and accumulation of acidic peat (pers. obs.). The Swan Hills have been included in the climafrost zone, where temporary frozen layers persisting at least one full year are to be expected in some peatlands (Lindsay and Odynsky 1964). Permafrost features have been found at Freeman Lake, near the town of Swan Hills, but may be relics indicating past periods of permafrost (S. Zoltai, pers. com. Canadian Forest Service, Edmonton, Spring, 1983, conversation). No permafrost has been found in the study area, although the surveys in this respect were cursory.

7. VEGETATION

The 13 vegetation types identified in the study area and the nine map subunits and four units (Map 2) in which they are found are as follows:

Coniferous forest unit

Submesic - subhygric coniferous forest subunit

Rubus pedatus - *Cornus canadensis* type

Calamagrostis canadensis - *Rubus pedatus* type

Gymnocarpium dryopteris - *Cornus canadensis* / feathermoss type

Ledum groenlandicum / *Vaccinium membranaceum* - *V. myrtilloides* type

Hygric coniferous forest subunit

Picea mariana / *Ledum groenlandicum* / *Equisetum sylvaticum* - *Rubus chamaemorus* / *Sphagnum* - feathermoss type

Open wetland unit

Treed fen subunit

Picea mariana / *Carex pauciflora* - *Rubus chamaemorus*/*Sphagnum* V. type

Open fen subunit

Menyanthes trifoliata - *Carex limosa* type

Carex rostrata - *C. aquatilis* type

Swamp subunit

Alnus / *Calamagrostis canadensis* type

Floodplain vegetation unit

Shrubland subunit

Salix / *Calamagrostis canadensis* - *Carex aquatilis* type

Herb meadow subunit

Calamagrostis canadensis - *Bromus canadensis* - *Schizachne purpurascens* - *Epilobium angustifolium* - *Thalictrum venulosum* type

Seepage vegetation unit

Tall shrubland subunit

Alnus - *Salix* / *Calamagrostis canadensis* - *Heracleum lanatum* type

Deciduous woodland subunit

Populus / *Alnus* / *Heracleum lanatum* - *Calamagrostis canadensis* type

Discussion of the species composition of the individual vegetation types, the distribution of the types and general characteristics of the sites on which they are found are presented in the following sections. Vegetation plot descriptions are included in Appendix A.

7.1 Coniferous Forest Unit

Moisture regime was found to be an important parameter in differentiating vegetation types and subunits within the coniferous forest unit. Generally, submesic to subhygric moisture regimes were found on fairly deep medium-textured soils, with submesic regimes most common on upper slopes and crests and subhygric regimes most common on lower slopes. Hygric regimes were characteristic of sites with seepage or the water table at or near the surface.

7.1.1 Submesic to Subhygric Coniferous Forest Subunit

The submesic to subhygric coniferous forests have canopies dominated by *Abies lasiocarpa* X *Abies balsamea*, *Picea englemannii* X *P. glauca* and *Pinus contorta*. *Abies* was frequently prominent in the understorey; however, *Picea* was uncommon and *Pinus contorta* virtually absent. Table 1 lists tree core data from a number of stands.

Table 1

Tree Core Data

Pinus contorta		*Picea*		*Abies*	
height (m)	# rings	height (m)	# rings	height (m)	# rings
16	180			14	140
16	160	15	125	14	125
		17	100	16	100
18	100	17	100		
15	100	15	95	16	130
15	100			13	85
14	100			12	105

Note: Submesic to subhygric coniferous forests.

Understorey observations, height comparisons and age comparisons show that although all three species may be established contemporaneously, in most cases *Pinus contorta* regenerates first and *Abies* last. Furthermore, it appears that *Abies* eventually dominates most forest canopies in the absence of fire.

Tree cores suggest most stands are less than 200 years old, and charred wood in many stands attests to the prevalence of fire. Very recent fires have led to post-fire pioneer communities in three areas. The north block central burn occurred in 1982, the north block eastern boundary burn in 1981. The age of the south block northwestern burn was not determined. Recent burns are indicated on the vegetation map (Map 2) by a lower case (b).

Four types of submesic to subhygric coniferous forests were recognized, however, they could not be mapped reliably.

Canopy composition is similar throughout all four types, although canopies tend to be taller and more open in the Calamagrostis canadensis - Rubus pedatus phase. The tall shrub layer is usually open and dominated by conifer saplings (primarily Abies). The medium shrub layer averages 20 - 25% cover and is generally dominated by Abies; however, Ledum groenlandicum is occasionally prominent in the Rubus pedatus - Cornus canadensis type and often prominent in the Ledum groenlandicum / Vaccinium membranaceum - V. myrtilloides type.

The low shrub/herb layer cover varies considerably but averages 50% to 70%. Rubus pedatus is prominent in all types. However, in Rubus pedatus - Cornus canadensis type, Cornus canadensis is co-dominant; in the Calamagrostis canadensis - Rubus pedatus type, Calamagrostis canadensis is co-dominant; in the Gymnocarpium dryopteris - Cornus canadensis/feathermoss type, Cornus canadensis and Gymnocarpium dryopteris are co-dominant; and in the Ledum groenlandicum / Vaccinium membranaceum - V. myrtilloides type, Vaccimium myrtilloides, V. membranaceum and Cornus canadensis are co-dominant. Lycopodium annotinum, Linnaea borealis and Streptopus amplexifolius are frequent in most types. Feathermosses generally dominate the bryoid layer.

Rubus pedatus - Cornus canadensis Type. The central type of submesic to subhygric coniferous forest from which the succeeding types represent departures. It occurs on mesic to submesic upper and mid slopes and crests. Aspect seems unimportant, and slope gradient varies from nearly level to very strong (to 45%).

Canopies reach 14 m to 20 m (mean 17 m) and vary from 40% to 90% cover (mean 60%). The tall shrub layer is generally quite open (mean value of 3%). In one stand, however, Abies reached 40% cover. The medium shrub layer has cover values averaging 20% (0 - 50%). Again, Abies dominates; however, Ledum groenlandicum and Rhododendron albiflorum (cover value of 65% in one stand) are occasionally dominant.

The herb layer is prominent, with a mean cover value of 60% (20 - 90%). Rubus pedatus and Cornus canadensis dominate, while Vaccinium membranaceum, Lycopodium annotinum, Linnaea borealis, Abies seedlings, Streptopus amplexifolius and Pyrola secunda are frequent in minor amounts. Feathermosses dominate the bryoid layer, with Pleurozium schreberi and Rhytidium crista-castrensis having a mean combined cover of 55%. Dicranum fuscescens is a frequent minor associate.

Calamagrostis canadensis - Rubus pedatus Type. Generally occurs on subhygric sites on upper slopes to toes. Slope gradients are nearly level to very strong (35%), and southeast aspects are favored where gradients exceed 5%.

Canopies reach 15 m to 25 m (mean 19 m) and vary from 20% to 50% cover (mean 40%). The tall shrub layer is generally absent. The medium shrub layer reaches an average cover value of 20% (5 - 50%) and is strongly dominated by Abies. In an atypical stand Salix discolor, S. pyrifolia and Lonicera involucrata each had a 15% cover value and Abies was very minor in the medium shrub layer.

The herb layer has a mean cover value of 70% (50 - 85%). Calamagrostis canadensis clearly dominates (mean cover value of 30%) with Rubus pedatus (10%). Other frequent species include Cornus canadensis, Epilobium angustifolium, Streptopus amplexifolius, Ribes lacustre, Equisetum sylvaticum, Lycopodium annotinum, Actaea rubra, Mertensia paniculata, Linnaea borealis and Arnica cordata.

The bryoid layer is generally open, with a mean cover value of 25%, although in one stand it reached 85%. Feathermosses (Pleurozium schreberi, Ptilium crista-castrensis and Hylocomium splendens) dominate with a mean combined cover value of 20%. Dicranum fuscescens is also fairly frequent with a mean cover value of almost 4%.

Gymnocarpium dryopteris - Cornus canadensis / Feathermoss Type. Occurs on mesic to subhygric crests to lower slopes. Gradients vary from gentle to strong (7 - 25%) but aspect seems unimportant.

Canopies reach 14 m to 18 m (mean 15 m) and vary from 45 - 80% (mean 60%). The tall shrub layer is generally very open (mean over 5%) and is almost exclusively composed of Abies. The medium shrub layer has a mean cover value of 25% (5 - 60%) and is also dominated by Abies.

The herb layer has a mean cover value of 70% (50 - 80%). It is dominated by Gymnocarpium dryopteris with a mean cover of 14%, Rubus pedatus (9%), and Cornus canadensis (9%). Frequent minor species include Lycopodium annotinum, Tiarella trifoliata, Linnaea borealis and Streptopus amplexifolius.

The bryoid layer is usually closed, with a mean cover value of 65% (35 - 90%). The feathermoss cover value averages 55% (35 - 80%).

Ledum groenlandicum / Vaccinium membranaceum - V. myrtilloides Type. Generally occurs on mesic upper and mid slopes. Gradients vary from nearly level to very strong (to 45%), and southern aspects are favored.

Canopies generally reach 12 m to 20 m (mean 16 m), with cover values of 45 - 65% (55%). The tall shrub layer is composed of conifer saplings and is generally very open. The medium shrub layer has a mean cover value of 25% (5 to 50%) and is usually dominated by various proportions of conifer saplings and Ledum groenlandicum.

The herb layer has a mean cover value of 50% (40 - 85%) and is dominated by Vaccinium myrtilloides (22%), V. membranaceum (8%), Cornus canadensis (8%) and Rubus pedatas (7%). Feathermosses dominate the bryoid layer, with a mean cover of 60% (mean cover of stratum is 66%). Sphagnum is occasionally prominent.

7.1.2 Hygric Coniferous Forest Subunit

Picea mariana / Ledum groenlandicum / Equisetum sylvaticum - Rubus chamaemorus / Sphagnum - Feathermoss Type. The only type recognized in the hygric coniferous forests subunit. It occurs on level to very gentle (0 - 5%) slopes with no favored aspect. The moisture regime is generally hygric, and standing water is often present but minor (0 - 5% cover).

Canopies are low to moderately high (7 - 15 m). Their cover generally varies from 20 - 50%, although in one open stand canopy cover was only 7%. Picea mariana is dominant although Pinus contorta is occasionally a minor associate.

Picea mariana is the only regenerating tree species. Cores were obtained from canopy trees in two plots. The trees were 10 m and 11 m tall and had 200 and 80 growth rings, respectively. Both stands were similar in canopy and minor vegetation. The growth ring data and high distribution observations suggest that this vegetation type is successionally stable.

The tall shrub layer is minor and composed exclusively of Picea mariana. In contrast, the medium shrub layer is prominent (20 - 60% cover). Ledum groenlandicum is dominant (mean of 20% cover) while dwarf birches (Betula pumila, B. glandulosa) and Picea mariana are frequent associates and occasional co-dominants. Salix pyrifolia occurred as the dominant medium shrub (25%) in one stand.

The low shrub/herb layer is prominent (mean 50% cover). Equisetum sylvaticum (20%) and Rubus chamaemorus (10%) are dominant. Vaccinium vitis-idaea, Gaultheria hispidula, Smilacina trifolia and Vaccinium myrtilloides are frequent minor (low cover) associates. Vaccinium membranaceum (to 15%), Carex trisperma (to 25%), Calamagrostis canadensis (to 10%) and Carex brunnescens (to 10%) are occasionally prominent.

The bryoid layer (50 - 90% cover) is dominated by Sphagnum (40%) and the feathermosses Pleurozium schroberi and Ptilium crista-castrensis (combined mean cover of 30%).

7.2 Open Wetlands Unit

Open wetlands including patterned fens cover less than 20% of the study area. Four vegetation types are identified. Treed fens occupy hygric sites and grade into open fens (two types) with an increase in moisture. Swamps tend to occupy hygric sites along minor drainage courses where nutrient availabity is probably greater. Patterned fens, which are complexes of treed and open fens, are described in special features (9.4).

Alnus forms a prominent tall shrub layer in swamps; however, this layer is poorly developed in the other open wetland types. The medium shrub layer is poorly developed in Alnus swamps, but in the other types it is often prominent and generally dominated by Betula pumila x B. glandulosa and Ledum groenlandicum.

The herb/low shrub layer is dominated by Carex pauciflora and/or Rubus chamaemorus in treed fens, by either Menyanthes trifoliata and/or Carex limosa or Carex rostrata and/or C. aquatilis in the two open fen types, and by Calamagrostis canadensis in swamps.

The bryoid layer of open wetlands is generally well-developed, and dominated by Sphagnum angustifolium and/or S. magellanicum where mosses are prominent.

7.2.1 Treed Fen Subunit

Carex pauciflora - Rubus chamaemorus / Sphagnum Type. The only type recognized in the treed fen subunit. It appears to be a poor fen type, based on the presence of Sphagnum angustifolium and Tomenthypnum falcifolium. Individual units cover up to 50 ha. However, as a whole the type covers less than 5% of the study area. The largest units are found near the large patterned fen (see 9.4) just south of the Goose River. These peatlands occur in hygric closed depressions and level areas, and grade into moister or richer fens. Canopies reach 5 - 12 m (mean 8 m) and their cover values vary 3 - 20% (mean 10%). Picea mariana dominates. The tall shrub layer is also dominated by Picea mariana. Its cover varies 5 - 20% (mean 10%) and is continuous with the canopy. The medium shrub layer has cover values varying 15 - 50% (mean 30%) and is dominated by Ledum groenlandicum (16%) Betula pumila x B. glandulosa (10%) and Picea mariana (5%).

The herb layer cover values vary 40 - 75% (mean 55%). It is dominated by Carex pauciflora (26%) and/or Rubus chamaemorus (19%). Frequent minor species include Smilacina trifolia, Kalmia microphylla, Andromeda polifolia, Picea mariana seedlings and Vaccinium oxycoccus.

The bryoid layer is very well developed, with cover values of 60 - 95% (mean 75%). Sphagna (notably S. angustifolium, S. magellanicum and S. girgensohnii) dominate, while Pleurozium schreberi is only occasionally prominent. Tomenthypnum falcifolium and Aulacomnium palustre are frequent and occasionally prominent.

7.2.2 Open Fen Subunit

Two open fen types were distinguished on the basis of species composition, however they could not be mapped separately. Together they cover less than 5% of the study area with individual units not extending beyond 10 ha in size. They occur on slight slopes along minor drainage courses.

Menyanthes trifoliata - Carex limosa Type. Consists of poor fens in subhydric to hydric depressions. Canopy and tall shrub layers are missing. A medium shrub layer may be present, with mean cover values generally less than 10%. It is composed of Betula pumila x B. glandulosa and low Picea mariana.

The herb layer cover generally varies 50 - 60% and is dominated by Menyanthes trifoliata (mean cover of 17%) and/or Carex limosa (18%). Oxycoccus microcarpus is a frequent minor (low cover) species, and although the following are not frequent they are occasionally prominent: Equisetum fluviatile, Salix pedicellaris, Eriophorum spp., Carex tenuiflora and Juncus stygius.

The bryoid layer is variably developed, with cover varying 25 - 100% (mean 65%). Sphagna (notably S. angustifolium and S. magellanicum) dominate, with a mean cover value of 50%. Drepanocladus exannulatus is frequent and occasionally dominant.

Carex rostrata - C. aquatilis Type. Occurs in subhygric to hygric depressions. No canopy exists; however, the sapling/tall shrub layer may have up to 15% cover of Picea mariana. The medium shrub layer cover value varies 5% to 30% (mean 20%). Betula glandulosa (11%) and Ledum groenlandicum (8%) dominate.

The herb layer has cover values of 55% to 75% (mean 65%). Plot sheets show dominance by either Carex rostrata or C. aquatilis. The combined

cover values of these tall sedges varies 30 - 60% (mean 45%). Other frequent species include Eriophorum chamissonis, Smilacina trifolia, Carex limosa, C. pauciflora and Andromeda polifolia.

The bryoid layer has cover values of 60 - 95% (mean 75%) and is dominated almost to exclusion by Sphagna (notably S. angustifolium, S. magellanicum and S. girgensohnii).

7.2.3 Swamp Subunit

Alnus / Calamagrostis canadensis Type. Occurs in subhygric depressions along drainage courses where water table fluctuations lead to drier summer soils than are found in Salix shrubland (7.3.1). It covers less than 5% of the study area, generally in bands too narrow to map. Special feature 7 is an unusual Larix laricina - Alnus version of this type (section 9.7).

A canopy of widely scattered Abies and/or Picea mariana may exist. The tall shrub layer is close to dense (cover values of 50% and 80% in two plots described) and is dominated by Alnus spp. The medium shrub layer is virtually absent.

The herb layer is moderately well developed, with cover values of 40% and 60% in our plots. Calamagrostis canadensis generally dominates; however, Carex brunnescens was prominent in one of the plots. The bryoid layer cover varies widely, however Sphagna are usually dominant.

7.3 Floodplain Vegetation Unit

The only major floodplain development occurs along a 2 - 3 km reach of the Goose River and on a 1 km reach of a headwater tributary to the Freeman River just outside of the north block. The floodplains

are less than 100 m wide, with narrow (less than 5 m) meandering channels. Bed materials vary from cobbles to fine silt.

The floodplains support a mosaic of fen, swamp and subhydric - mesic shrublands and herb meadows. The first two are similar to fen and swamp types described in the previous section. The last two types which appear on alluvial materials which may be periodically flooded, are described in the following section.

7.3.1 Shrubland Subunit

Salix / Calamagrostis canadensis - Carex aquatilis Type. Found on subhygric - subhydric slope toes and depressions along the floodplain of the Goose River. Widely scattered Picea mariana and Larix laricina may form a stunted (to 10 m) tall shrub layer. The well-developed (roughly 60% cover values) medium shrub layer is dominated by Salix (primarily S. mackenzieana and S. planifolia) with a minor component of Betula glandulosa.

The herb layer is also well developed (cover values roughly 50%) and dominated by various proportions of Calamagrostis canadensis and Carex aquatilis. Aside from these two dominants, the herb composition is extremely variable.

The cover values for the bryoid layer are also quite variable but Sphagnum generally dominates.

7.3.2 Herb Meadow Subunit

Calamagrostis canadensis - Bromus canadensis - Schizachne purpurascens - Epilobium angustifolium - Thalictrum venulosum Type. Occurs on south slopes with various gradients along the floodplain of the Goose River. Moisture regimes are hard to determine, but three points suggest there are strong water table fluctuations:

1. Trees are scarce or absent;
2. The vegetation includes a mix of mesophytic and hygrophytic species, and
3. The areas are restricted to river valleys.

The vegetation is dominated by three grasses, Calamagrostis canadensis, Bromus canadensis and Schizachne purpurascens, which are present in various proportions. Other frequent species include Epilobium angustifolium, Thalictrum venulosum, Solidago gigantea, Delphinium glaucum, Geum macrophyllum, Aster modestus, Carex pachystachya, Agrostis scabra, Cirsium foliosum, Arnica chamissonis and Phleum commutatum. Many of the latter species may be abundant at different sites. Mosses are scarce, apparently because of the thick herb cover.

7.4 Seepage Vegetation Unit

The seepage vegetation unit is a complex of vegetation types associated with surface or near-surface seepage on mineral soils. The complex occurs on slopes in the escarpment and covers less than 15% of the study area. It usually occurs closely interspersed with Submesic - Subhygric Coniferous Forest. The largest pure unit of seepage vegetation covers 50 ha along East Prairie Creek near the north boundary of the study area.

Two major types are recognized: Alnus - Salix/Calamagrostis canadensis - Heracleum lanatum; and Populus/Alnus/Heracleum lanatum - Calamagrostis canadensis.

7.4.1 Tall Shrubland Subunit

Alnus - Salix/Calamagrostis canadensis - Heracleum lanatum Type. Occurs on subhygric to subhydric upper slopes to depressions. Moderate

to strong slope gradients are favored, however slopes range 3 - 35%. There is a noticeable preference for more northern aspects where the slope gradient is over 10%; however, this simply reflects the scarcity of strong south - facing slopes in the study area.

Tree canopies may reach 20 m, but are generally absent or very open (mean cover value 5%, range 0 - 20%). Picea sp., Pinus contorta and Populus balsamifera variously dominate, however Abies sp. and Populus tremuloides are occasionally present.

Although Salix bebbiana often exceeds the abritary 5 m limit set for the top of the tall shrub layer, it is best considered as a part of that layer. The tall shrub layer is absent to moderately closed (mean cover value of 40%, ranges to 70%). Alnus spp. and Salix spp. (primarily S. bebbiana and S. planifolia) dominate.

The low shrub layer is very open, with a mean cover value of 5% (0 - 20%). Lonicera involucrata and lower individuals of Alnus spp. dominate.

The low shrub/herb layer varies from closed to dense, with a mean cover value of 80% (50 - 100%). It is least developed under dense Alnus spp. Calamagrostis canadensis and Heracleum lanatum variously dominate, with a number of frequent but minor associated species (Athyrium filix-femina, Rubus strigosus, Delphinium glaucum, Mertensia paniculata, Urtica gracilis, Senecio triangularis, Equisetum sylvaticum, Gymnocarpium dryopteris and Galium triflorum). Viburnum edule or Carex brunnescens are infrequent but occasionally prominent.

The cryptogam mat is poorly developed, with a mean cover value of 5% (0 - 15%). Plagiomnium medium and Brachytherium starkei are most prominent, while feathermosses and Sphagnum are rarely present.

7.4.2 Deciduous Woodland Subunit

Populus / Alnus / Heracleum lanatum - Calamagrostis canadensis Type. Occurs on subhygric to hygric valley slopes and floodplains. The canopy reaches 15 m to 18 m and its cover value varies greatly. *Populus balsamifera* dominates but is not found in lower strata. In one floodplain plot, *Picea* sp. and *Abies* sp. were present in the understorey, indicating a probable trend in succession.

The tall shrub layer is generally well developed, with a mean cover value of 45% (25 - 65%). *Alnus* spp. are dominant. The low shrub layer is generally similar to and continuous with the tall shrub layer.

The herb layer is usually very well developed, with a mean cover value of 80% (65 - 90%). Species richness is generally high, and no species is consistently dominant. A number of species which appear to favor moist nutrient-rich environments are frequent and often dominate (*Heracleum lanatum*, *Calamagrostis canadensis*, *Delphinium glaucum*, *Viburnum edule*, *Mertensia paniculata*, *Petasites palmatus*).

The bryophyte layer is usually insignificant (no cover values in excess of 1% were observed).

7.5 Related Studies

7.5.1 Comparison of Vegetation Types

Five vegetation studies are of particular relevance to our area. Moss and Pegg (1963) discuss upland coniferous forests of Rowe's (1972) Lower Foothills Section. Their six sites occur in or very near the Foothills Natural Region mapped by Alberta Parks (n.d.).

Lesko and Lindsay (1973) describe forest types south of Chip Lake in what Rowe (1972) maps as part of the Lower Foothills Section but which Alberta Parks (n.d.) maps as the Mixedwood Section. Vitt, Achuff and Andrus (1975) describe the vegetation of patterned fens in and very near the candidate reserve. Achuff and LaRoi (1977) describe Picea - Abies forests in highlands of northern Alberta, including several sites in the Swan Hills. Corns (1978) describes forest community types in the Wapati map sheet, which lies largely within the Upper and Lower Foothills and partially within the Mixedwood and Subalpine East Slopes Rockies sections of Rowe (1972), or largely within the Foothills and partially within the Mixedwood and Rocky Mountain Sections of Alberta Parks (n.d.) classification system.

The following discussion is concerned only with three mapping components, the Submesic to Subhygric Coniferous Forest and Hygric Coniferous Forest Subunits of the Coniferous Forest Unit, and the Open Wetland Unit. Literature concerned with vegetation corresponding to the other units is uncommon and adds little to the discussion.

Submesic to Subhygric Coniferous Forest. A subunit roughly similar to the upland coniferous forest association of Moss and Pegg (1963 P. 1096) who state: "Despite local dominance on the part of different tree species the forest is remarkably constant in the floristic composition of shrub, herb and floor strata. This seems to hold true even when there are evident differences in physiography, substratum and history." The authors then proposed four rather weakly - distinguished faciations identified by the dominance of Picea glauca, Abies lasiocarpa (evidently all Abies was so identified), Picea mariana and Pinus contorta.

Viburnum edule, Lonicera involucrata, Rosa acicularis, Rubus strigosus, Oplopanax horridum, Ribes spp. and Vaccinium spp. were noted as common species of the discontinuous and "patchy" shrub stratum (Moss and Pegg 1963). The authors for this report found the same discontinuous physiognomy prevailed in the study area; however

Viburnum edule, Lonicera involucrata and Oplopanax horridum were infrequent while V. membranaceum, V. myrtilloides, Ribes spp., Ledum groenlandicum and Rhododendron albiflorum were most prevalent. Moss and Pegg note that the herb stratum is prominent and that the leading species include: Linnaea borealis, Cornus canadensis, Petasites palmatus, Calamagrostis canadensis, Rubus pubescens, Mitella nuda, Lycopodium annotinum, Streptopus amplexicaulis, Epilobium angustifolium, Mertensia paniculata and Equisetum sylvaticum. The research for this report found much the same pattern; however, Rubus pubescens and Mitella nuda were scarce and infrequent while Rubus pedatus and Gymnocarpium dryopteris were frequent leading species and often dominant.

In the carpet Moss and Pegg (1963) found feather mosses predominate, which concurs with the observations for this report, although Dicranum fuscescens was also found to be a frequent and often prominent species.

Lesko and Lindsay (1973) describe two major types, one dominated by Pinus contorta, while in the other Picea glauca dominates or is present as regeneration or small trees. The subdivisions of their major types are presented in Table 2. Their Pinus contorta - Vaccinium myrtilloides subtype initially appears similar to this report's Ledum groenlandicum / Vaccinium membranaceum - V. myrtilloides type. However, the former is limited chiefly to dunes, while the latter occurs on tertiary deposits, sometimes overlain by thin till. The absence of V. membranaceum and Rubus pedatus, and the constant presence of Rosa acicularis, Arctostaphylos uva-ursi, Vaccinium vitis-idaea, Geocaulon lividum, Elymus innovatus, Campanula rotundifolia and Shepherdia canadensis in their type clearly differentiates it.

The Lesko and Lindsay (1973) Pinus contorta / Elymus innovatus subtype finds no parallel in the study area, and is quite different from even the xeric meadows and woods described as special features (Sections 9.5 and 9.6).

The Lesko-Lindsay Picea glauca / Hylocomium splendens subtype differs from this report's submesic to subhygric coniferous forests by the constant presence of Rosa acicularis, Lonicera involucrata and Rubus pubescens and the absence of Rubus pedatus.

Table 2.

Upland Coniferous Forests of the Chip Lake Area

PINUS CONTORTA TYPE		
SUBTYPES		
Vaccinium myrtilloides	Arctostaphylos uva-ursi - Elymus innovatus	Aralia nudicaulis
PHASES		
Pinus contorta - Picea mariana / Vaccinium myrtilloides	Pinus contorta - Picea glauca / Arctostaphylos uva-ursi - Elymus innovatus	Pinus contorta/ Aralia nudicaulis
Pinus contorta - Picea mariana - Populus tremuloides/ Vaccinium myrtilloides	Pinus contorta - Picea glauca - P. mariana/ Arctostaphylos uva-ursi - Elymus innovatus	Pinus contorta/ Cornus stolonifera/ Aralia nudicaulis

PICEA GLAUCA TYPE

SUBTYPES

Hylocomium splendens	Vaccinium myrtilloides V. vitis-idaea	Carex - Equistum

Picea glauca/ Hylocomnium splendens	Picea glauca/ Vaccinium myrtilloides V. vitis-idaea - Lycopodium annotinum	Picea glauca/ carex - Equisetum
Picea glauca - Abies lasiocarpa Hylocomium splendens	Picea glauca/ P. mariana/ Vaccinium myrtilloides V. vitis-idaea	Picea glauca - P. mariana / Carex Equisetum/ - Sphagnum
Picea glauca - Betula papyrifera - Populus tremuloides/ Hylocomium splendens		

SOURCE: Modified from Lesko and Lindsay, 1973.

Their Picea glauca / Vaccinium myrtilloides - V. vitis-idaea subtype differs from our Ledum groenlandicum / Vaccinium membranaceum - V. myrtilloides type because of the absence of V. membranaceum and Rubus pedatus, and the constant presence of Rosa acicularis, Rubus pubescens, Galium boreale, Lathyrus ochroleucus and Maianthemum canadense.

Their Picea glauca / Carex - Equisetum phase and Pinus contorta / Aralia nudicaulis subtype has no close parallel in our study area.

Lesko and Lindsay (1973) also discuss a Picea mariana / Vaccinium myrtilloides - V. vitis-idaea subtype which is similar to our Ledum groenlandicum / Vaccinium membranaceum - V. myrtilloides type save for the constant presence of Rosa acicularis and absence of Vaccinium membranaceum in their subtype.

Achuff and LaRoi (1977) describe four Picea - Abies community types in the highlands of northern Alberta. Their Abies - Ledum groenlandicum / Rubus pedatus / Ptilium crista-castrensis type (found in the Swan Hills) is roughly equivalent to our Rubus pedatus - Cornus canadensis type, while their Abies - Viburnum edule - Lonicera involucrata / Cornus canadensis - Linnaea borealis / feathermoss type is weakly related to our Gymnocarpium dryopteris - Cornus canadensis / feathermoss type. Their Viburnum edule - Rosa acicularis / Cornus canadensis / Hylocomium splendens type has no equivalent in our area. They define a Rubus strigosus - Abies balsamea - Viburnum edule / Calamagrostis canadensis type which is similar to our Calamagrostis canadensis - Rubus pedatus type save for the absence or low cover of Rubus pedatus and the presence of R. pubescens in their subtype.

Of Corns' (in press) 16 types, four seem closely related to Goose Mountain vegetation. His Picea glauca - Hylocomium splendens type appears to be closely related to our Rubus pedatus - Cornus canadensis type save for the very low cover values he recorded for Rubus pedatus (which is seldom prominent in any of his stands). His

Pinus contorta / Ledum groenlandicum / Pleurozium schreberi and Pinus contorta / Picea mariana / Ledum groenlandicum / Vaccinium membranaceum types together are similar to our Ledum groenlandicum / Vaccinium membranaceum - V. myrtilloides type. Finally, his Pinus contorta / Rhododendron albiflorum / Vaccinium membranaceum seems very similar to one of the most unusual stands in our Rubus pedatus - Cornus canadensis type.

The frequent dominance of Rubus pedatus in the herb layer has no parallel in vegetation types reported for Banff and Jasper national parks (Holland and Coen 1983). However, it is often found in the moister Columbian Forest Region (pers. obs.). It appears that the east slopes of the Rocky Mountains interrupt the distribution of a number of species and communities common to the Swan Hills and more western areas (pers. obs.; P. Achuff, pers. com. Alberta Institute of Pedology, spring, 1983, converstion).

Hygric Coniferous Forest. Lesko and Lindsay (1973) make brief mention of a Picea mariana / Sphagnum which is quite similar to our hygric coniferous forest type, save for the lower abundance of Equisetum sylvaticum which was frequent and often abundant in our plots. The same comments hold true for Corns' (in press) Picea mariana / Ledum groenlandicum / Rubus chamaemorus type.

Open Wetlands. Vitt, Achuff and Andrus (1975) describe patterned fens in and near our study area in great detail. They recognize two flark types dominated by Menyanthes trifoliata and Carex limosa, each of which have Sphagnum jensenii and Drepanocladus exannulatus phases. These correspond to our Menyanthes trifoliata - Carex limosa fen type. They also describe two string associations dominated by Betula glandulosa / Tomenthypnum falcifolium - Aulacomnium palustre and Picea mariana / Ledum groenlandicum / Sphagnum

magellanicum which share some similarities with our Picea mariana / Ledum groenlandicum / Equisetum sylvaticum - Rubus chamaemorus / Sphagnum - feathermoss hygric coniferous forest and Carex pauciflora - Rubus chamaemorus fen types, but are too limited to include in our major vegetation types.

7.5.2 Discussion of Natural Region Designation

Most ecological region mapping in Alberta is based on or derived from Rowe's (1972) forest region scheme. Rowe included the Swan Hills in the Lower Foothills Section of the Boreal Forest region. The vegetation of this unit is characterized by the frequent admixture of Populus tremuloides and P. balsamifera in Pinus contorta stands which dominate post-fire pioneer forests. In addition, Picea glauca is an important constituent of older stands. The Upper Foothills Section has much less mixed Populus / conifer forest, although Picea glauca remains a major species. Finally, the East Slope Rockies Section of the Subalpine Forest region not only lacks the mixed forests, but Picea glauca is also replaced by Picea englemannii x P. glauca hybrids.

Achuff and LaRoi (1977) examined morphological characteristics of Picea in northern Alberta. They assigned a three-point morphological index in which Picea glauca characters have a value of one, and P. englemannii characters a value of three. Near Goose Mountain they found a Picea morphological index value of 1.85 $\pm$ 0.8. This value fits into their Intermediate (rather than P. glauca or P. englemannii) class, and can be taken as evidence of marked hybridization. Furthermore, their site was at 1280 m and much of the Goose Mountain candidate reserve is above this elevation. Since the correlation between index value and altitude was found to be highly significant, index values at the top of Goose Mountain may be still higher.

Kojima (1980) concluded from brief studies that higher elevations in the Swan Hills had vegetation more closely allied to subalpine than to boreal forest types. This conclusion was based on:

1. an apparent subalpine climate,
2. the widespread presence of subalpine indicator species and
3. the widespread dominance of Picea englemannii and Abies lasiocarpa in mature stands on mesic sites.

While the third point may involve a misinterpretation of Achuff and LaRoi (1977), the conclusion nevertheless seems valid.

Our studies revealed the presence of subalpine indicator species often dominating vegetation strata (Vaccinium membranaceum, Rhododendron albiflorum, Oplopanax horridum, Rubus pedatus, Tiarella trifoliata and many others) and confirmed the contribution of Picea englemannii morphological characters to Picea in the candidate reserve. As well, Populus tremuloides and P. balsamifera were found to be largely confined to a few steep slopes in valley situations. It thus appears that on the basis of vegetation the candidate reserve cannot be considered allied to the Lower Foothills Section. Furthermore, the escarpment and upper elevation areas along it (where Picea hybridization is evident and subalpine indicator species are prominent) are most closely allied to Rowe's (1972) East Slope Rockies Section of the Subalpine Forest region, not withstanding the absence of Pinus albicaulis.

As a whole, the Swan Hills may be an outlier of the Foothills Natural Region. The Goose Mountain candidate reserve, however, deserves even greater recognition as the most northeastern and most widely disjunct occurrence of subalpine ecosystems in Alberta and Canada.

8. FLORISTICS

Ninety non-vascular plant species, including 45 mosses, six liverworts and 39 lichens, were found in the study area. These are listed in Appendix B with notes on the habitats in which they were collected. A floristic analysis was not undertaken as little information is readily available on their distribution and significance in Alberta.

A total of 279 vascular plant species is reported for the study area, 55 of which had not previously been collected in the western Swan Hills, based on the maps of Packer (1983), and 30 of which had been reported previously and were not found during the course of this study. These are listed in Appendix C with notes on distribution (local, scattered, widespread), abundance (very scarce, scarce, occasional, abundant, very abundant), and habitats in which they were found. Only five species are considered introduced. Of the 30 species reported previously but not found in this study, the majority were species of open woods, meadows, ponds and disturbed areas.

8.1 Species with Cordilleran Affinities

Most of the flora are considered boreal forest species, however some (about 15%) show definite foothills and subalpine affinities. Thirty-three species found in the study area are largely confined to the foothills and mountains in Alberta based on the distribution maps of Packer (1983). Some of these, such as *Scirpus caespitosus*, *Juncus castaneus*, *J. stygius* and *Kalmia microphylla*, are species of marshes

and fens. Cystopteris montana, Epilobium hornemanii, Oplopanax horridum, Angelica genuflexa and Senecio triangularis are found on moist stream banks and in seepage area. Botrychium lunaria, Phleum commutatum, Epilobium leptocarpum, Veronica alpina, V. serpyllifolia, Cirsium foliosum and Hieracium triste characteristically occur in moist meadows and openings. The remainder are species of moist woodlands.

The cool, moist climate of Goose Mountain probably resembles that of the mountains and foothills and is therefore favorable to the growth and survival of species with cordilleran affinities. These species may have arrived on Goose Mountain prior to the last glaciation and persisted in refugia at high points in the Swan Hills. Alternatively, they may have dispersed to the area from the Rocky Mountains in wet, cool climatic periods following deglaciation. The question is of considerable interest to biogeographers.

The 33 species found in the study area which are largely confined to the foothills and mountains of Alberta include:

Lycopodium selago
L. sitchense
Botrychium lunaria
Cystopteris montana
Abies lasiocarpa balsamea
Picea englemannii glauca
Pinus contorta
Phleum commutatum
Trisetum spicatum
Scirpus caespitosus
Sorbus scopulina
Epilobium hornemanii / lactiflorum
E. leptocarpum
Oplopanax horridum
Angelica genuflexa
Kalmia microphylla
Rhododendron albiflorum
Vaccinium membranaceum
Veronica alpina
V. serpyllifolia

J. castaneus	Arnica cordifolia
Juncus stygius	A. latifolia
Streptopus streptopoides	Cirsium foliosum
Ranunculus uncinatus	Hieracium albiflorum
Mitella pentandra	H. triste
Rubus pedatus	Senecio triangularis

8.2 Rare or Uncommon Plant Species

Sixteen species of the study area are mapped in 10 or fewer Alberta locations (Packer 1983). The following species, considered rare or uncommon in Alberta are found in moist forests, fens and seepage areas:

* Lycopodium selago (6)	* Streptopus streptopoides (1)
* L. sitchense (9)	Coptis trifolia (8)
Cystopteris montana (6)	Ranunculus uncinatus (8)
* Phegopteris connectilis (3)	* Drosera anglica (7)
Carex deflexa (3)	Tiarella trifoliata (6)
C. loliacea (3)	Epilobium leptocarpum (4)
C. trisperma (3)	Oplopanax horridum (7)
* Luzula acuminata (2)	Angelica genuflexa (6)

NOTE: Bracketed numbers refer to number of locations mapped by Packer 1983; the symbol * refers to species mapped by Packer for the western Swan Hills but not found during this study.

9. SPECIAL FEATURES

Special features, for the purposes of this study, are sites with geological and/or vegetation characteristics considered unusual in a provincial or regional context. Eight are identified and are indicated on Map 2. In addition, the entire escarpment area should be viewed as a special feature because of its interesting geology and the presence of numerous upland forest and seepage communities and a number of uncommon microhabitats.

9.1 Moist Cobble Slopes (SF1)

One of these moist cobble slopes which was examined is a steep slope (15 m x 10 m) covered by a thick layer of rounded (up to 30 cm) cobbles (Tertiary deposits). The cobbles appear to retard vascular plant establishment, hence mosses and lichens dominate. Cladonia mitis and Dicranum fuscescens dominate in depressions where cobbles abut, while Umbilicaria hyperoptera and Leptogium saturninum dominate cobble surfaces. Other species include Cladonia rangiferina, C. coccifera, C. amaurocraea, C. gracilis, C. crispata, C. gonecha, Parmelia centrifuga and Cetraria nivalis. At its edge, the vegetation grades through Vaccinium vitis-idaea / feathermoss to submesic to subhygric coniferous forest.

A few other open areas of lichen- and/or moss-covered cobbles were noted along the escarpment. One of the most unusual of these sites is a xeric cobble slope with crustose lichens (Parmelia centrifuga, Umbilicaria hyperoptera and Rhizocarpon eupetraeum), east of the fire tower and outside of the reserve boundary. This area is separated from the south block of the candidate reserve by an airstrip, and from the north block by the fire tower and airstrip.

These sites are of provincial significance.

9.2 Compound Slump Area (SF2)

The compound slump site includes an active slumping cliff, the bare eroded tips of rotated slump toes, the colluvial/alluvial fans at its base and the beaver ponds between the toes.

The cliff exposes poorly consolidated shale and sandstone strata which are rapidly weathering to clay and sand. The face is almost devoid of vegetation because of its active nature. The alluvial deposits at its base are washed colluvial materials. A bed of quicksand on this level area supports an unusual stand of Typha angustifolia, Carex aquatilis, Equisetum arvense, Salix planifolia, Glyceria striata, Carex brunnescens and Calamagrostis canadensis. A better-drained portion of these level alluvial deposits supports a rich Populus balsamifera / Alnus / Heracleum lanatum - Delphinuim glauca forest community, with a few clumps of Oplopanax horridum along its edge.

The perched beaver ponds area is floristically diverse, supporting a number of species uncommon in the study area (Equisetum fluviatile, Habenaria hyperborea, Elatine triancha, Potamogeton alpinus, Sparganium hyperboreum, Lemna minor, Halenia deflexa, Hippuris vulgaris and Lathyrus ochroleucas).

The site is of regional significance.

9.3 Floodplain Herb Meadows (SF3)

Rich herb meadows are found scattered along a 1 km reach of the Goose River in the western portion of the south block. They appear to occur on better-drained alluvial deposits and grade into willow shrublands on moister sites.

The meadows are characterized by associations of plant species whose distributions are very restricted in the candidate ecological reserve. The dominant species are Bromus canadensis, Schizachne purpurascens and Calamagrostis canadensis. Species restricted solely to these sites are Thalictrum venulosum, Vicia americana, Penstemon procerus, Galium boreale, Cirsium foliosum and Solidogo gigantea. Species found only here and in seepage herb communities include Phleum commutatum, Agropyron trachycaulum, Carex pachystachya, Rumex occidentalis, Delphinium glaucum, Geum macrophyllum and Aster modestus. Four species, Trisetum spicatum, Carex praticola, Lathyrus ochroleucus and Arnica chamissonis, occur elsewhere only on bare eroding slopes.

The riparian herb meadows are considered special features because of their restricted distribution and the high incidence of plant species which are uncommon in the candidate reserve. They are features of regional significance.

9.4 Patterned Fens on Drainage Divides (SF4)

Two large patterned fens are found in the candidate ecological reserve, one approximately 130 ha in area in the eastern portion of the north block, the other approximately 100 ha in area in the south-central portion of the south block. They have been described in a paper by Vitt, Achuff and Andrus (1975) as occupying "saddles" along a water-table divide and receiving weakly minerotrophic waters which exhibit divergent water-flow patterns.

The complex interaction of climatic, hydrologic, edaphic and biologic factors over time has produced a patterning which consists of alternating peat ridges (strings) and water-filled depressions (flarks) oriented with the long axis across the slope and often somewhat bowed downslope. Vitt, Achuff and Andrus (1975) concluded that these were poor fens, based on their observation of a mean pH of 5.2 and Ca^{2+} concentration of 2.3

The species richness of these poor fens is much lower in relation to that of rich fens studied in the foothills of western Alberta (Slack, Vitt and Horton 1980).

Strings reach about 5 m in width and 0.75 m in height and are dominated by Picea mariana, Betula glandulosa, Ledum groenlandicum, Carex pauciflora (occasionally) and Sphagnum magellanicum. Flarks reach about 10 m in width and 1 m in depth, and are dominated by Menyanthes trifoliata, Carex limosa/paupercula, Eriophorum chamissonis, Sphagnum jensenii and Drepanocladus exannulatus.

Notable vascular plant species associated with these patterned fens are: Scheuchzeria palustris (uncommon), Carex heleonastes (uncommon; west-central Alberta), Scirpus cespitosus (uncommon cordilleran and Precambrian Shield), Juncus stygius (uncommon, cordilleran and west-central Alberta) and Drosera anglica (uncommon, west-central Alberta). Vitt, Achuff and Andrus (1975) report Chamaedaphne calyculata at the southern limit of its range in these large patterned fens.

The presence of uncommon and cordilleran species, and the extensive, undisturbed nature of these patterned fens, makes them a special feature of the candidate ecological reserve. They are of regional significance.

Small, confined pattern fens are found along drainage courses in the southern block. These are similar in vegetation composition and pattern to the large patterned fens. One particularly interesting small patterned fen straddles a narrow divide at the headwaters of the Swan River. It lies just outside the southeast corner of the north block, inside a bend in the access road. This fen has also been mapped and described in detail by Vitt, Achuff and Andrus (1975). During this study Juncus stygius, an uncommon cordilleran species, and Carex scirpoidea, a largely cordilleran species at its northern limit in the Swan hills, were collected in this small patterned fen.

9.5 Mesic Deciduous Woods and Subxeric Meadows (SF5)

Mesic deciduous woods with subxeric meadows occur on a steep (60 - 90%) southwestern slope in the escarpment.

It has a closed (70%) canopy of Populus tremuloides and P. balsamifera, an open (35%) medium shrub layer dominated by Shepherdia canadensis, and a closed (65%) herb layer dominated by Viburnum edule, Aster ciliolatus and Fragaria virginiana. Other herbs include Hedysarum boreale, Achillaea millefolium, Viola renifolia, Geocaulon lividum, Hieracium scabriusculum, Aquilegia brevifolia and Schizachne purpurescens, all of which are uncommon in the study area. The mesic forest is regionally significant.

The nearby subxeric meadows occur on eroding sandstone. The herb layer includes most of the uncommon species mentioned above, as well as Festuca saximontana and Agropyron trachycaulum. This meadow is of regional significance.

9.6 Subxeric Meadow (SF6)

Special feature 6 occurs on a subxeric, steep (75%), sandy slope with a southwest aspect. The herb layer is dominated by Elymus innovatus (50%), Symphoricarpus albus (20%) and Rosa acicularis (10%). Other meso-/xero-phytic species include Antennaria nitida, Stellaria longipes, Arctostaphylos uva-ursi, Fragaria virginiana and Aralia nudicaulis. The additive effects of slope position, gradientand aspect are responsible for the unusual moisture regime. Aspen woods surround the site, grading into subhygric to submesic coniferous forest. The presence of a few scattered aspen saplings in the dry meadow may reflect forest encroachment or a static situation.

This site is of regional significance.

9.7 Larix - Alnus Swamp at Tributary Headwaters (SF7)

An unusual feature was noted just outside the southwest corner of the south block at the headwaters of a tributary to the Freeman River. The 5 ha feature is a slight depression with minor drainages entering from the north, west and east that exist as one tributary southward. A vegetation association not noted elsewhere in the proposed reserve is found here.

It appears to combine elements of a number of community types and has a relatively rich herb stratam of 23 species. The site is hygric with 10% standing water and abundant deadfall. There is a 15 m tall tree canopy of Larix laricina (20%) and Picea mariana (10%), a 2 - 7 m tall shrub stratum of Alnus tenuifolia (25%) and Salix bebbiana (+), a 1 - 2 m tall mid shrub layer of Salix pyrifolia (5%) and Betula glandulosa (5%), a herb-dwarf shrub layer dominated by Calamagrostis canadensis (50%), Potentilla palustris (10%) and Rubus chamaemorus (5%), and a bryoid layer dominated by Sphagnum squarrosum (15%), Sphagnum teres (15%) and Pleurozium schreberi (15%). Carex loliacea, a species of marshes and moist banks and rare in Alberta, was collected here.

This site is of regional significance.

9.8 Pinus - Alnus Swamp and Beaver Pond in Perched Bowl (SF8)

A special feature was noted along the northern boundary of the north block at the headwaters of a tributary flowing northwest into East Prairie Creek. The feature is a small (10 ha) bowl in a side valley which appears perched above the main valley. Beaver have blocked drainage from the valley to form a small pond. Such water bodies, which are scarce in the area, are probably important for wildlife.

Upstream of the pond is an unusual vegetation association not noted elsewhere in the study area. The site, on a gentle north slope, is hygric and severely mounded. There is a 20 m high tree canopy of Pinus contorta (15%) and Picea glauca, a 2 - 8 m tall shrub layer of Alnus tenuifolia (60%) and a 1 m tall shrub layer of Viburnum edule (20%), Rubus strigosus (5%) and Lonicera involucrata (3%).

The composition of the herb layer is similar to that of seepage communities and is dominated by Calamagrostis canadensis (40%), Urtica gracilis (5%), Senecio triangularis (5%) and Athyrium filix-femina (3%). Heracleum lanatum assumes dominance on drier sites. The bryoid layer is dominated by Brachythecium starkei (10%).

On drier, steeper slopes immediately up-valley, Pinus contorta disappears and dense thickets of Alnus tenuifolia dominate. These Alnus communities are similar to others found elsewhere in the study area.

This site is of regional significance.

10. SUMMARY AND RECOMMENDATIONS

The Goose Mountain candidate ecological reserve is part of a flat-topped erosion remnant capped primarily by Tertiary cobbles and thin till. It rises sharply from the north as a prominent escarpment and slopes gently to the south. The upland's high elevation and the orographic effect of the escarpment result in a cooler, moister climate than is found in surrounding areas. This favors the development of more podzolized soils and is in part responsible for a flora with strong cordilleran affinities.

Several vegetation types are recognized, and through comparison with studies in nearby areas the cordilleran influence becomes clearer. Sixteen vascular plant species, considered rare or uncommon in Alberta, are found here. Eight special features are described which confirm its unique values to the ecological reserves program in Alberta.

The authors of this report recommend minor boundary changes to include peripheral features. The small patterned fen discussed in Section 9.4 should be included within the Candidate Ecological Reserve boundaries because of its distinctive plant species, the high diversity of patterning within a small area and the ease of access for research purposes.

Extension of the candidate reserve boundary to include the Larix Alnus swamp (Section 9.7) would add a significant feature to reserve and would also more sensibly include the remainder of the patterned fen, which is now only partially within the reserve. Unfortunately, within the last few years a north-south cutline has been extended through a portion of the site.

A small portion of the Pinus-Alnus swamp and the beaver pond in the perched bowl (Section 9.8) is presently in the candidate reserve. The boundary should be extended approximately 0.5 km to the north in order to include the remainder of this unusual vegetation.

We strongly recommend the inclusion of this area in the ecological reserves system in order to protect its unique values as (1) a disjunct occurrence of modified subalpine ecosystems, and (2) the location of a number of features significant in both regional and provincial contexts.

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Appendix A

ANNOTATED VASCULAR PLANT SPECIES LIST

Vascular Plant Species Reported in This Study (249 Species)

*Indicates species not previously mapped for the western Swan Hills.

OPHIOGLOSSACEAE

Botrychium lunaria (L.) Sw.

Local, very scarce; submesic sandy slope.

POLYPODIACEAE

Athyrium filix-femina (L.) Roth

Scattered, scarce-abundant; seepage herb and shrub communities, alder swamp, subhygric coniferous forest.

Cystopteris fragilis (L.) Bernh.

Scattered, scarce; seepage shrub communities; subhygric coniferous forest.

* Cystopteris montana (Lam.) Bernh.

Local, very scarce; seep in hygric open coniferous forest.

Dryopteris carthusiana (Vill.) H. P. Fuchs.

Widespread, scarce-abundant; subhygric-mesic coniferous forests, seepage herb and shrub communities.

Gymnocarpium dryopteris (L.) Hewm.

Widespread, scarce-abundant; subhygric-mesic coniferous forets, seepage herb and shrub communities.

EQUISETACEAE

* Equisetum arvense L.

Widespread, occasional-abundant; riverine with shrubland and swamp, hygric-subhygric coniferous forest, seepage herb and shrub communities, subhygric balsam poplar woodland, sub-xeric meadow.

Equisetum fluviatile L.

Scattered, occasional-abundant; sedge fens, treed swamp.

* Equisetum laevigatum A. Br.

Local, scarce; low sedge fen, hygric open coniferous forest.

* Equisetum pratense Ehrh.

Scattered, occasional; riverine subhygric coniferous woodland, seepage herb and shrub communities.

Equisetum scirpoides Michx.

Local, scarce; valley slope hygric coniferous wood, edge of exposed slope.

Equisetum sylvaticum L.

Widespread, occasional-very abundant; hygric-submesic coniferous forests, seepage herb and shrub communities.

LYCOPODIACEAE

Lycopodium annotinum L.

Widespread, occasional-abundant; hygric-submesic coniferous forests.

Lycopodium clavatum L.

Local, very scarce; submesic coniferous forest.

Lycopodium complanatum L.

Local, very scarce; submesic mixed coniferous-deciduous forest.

Lycopodium obscurum L.

Local, scarce-occasional; mesic mid-slope coniferous forest.

CUPRESSACEAE

* Juniperus communis L.

Local, very scarce; mesic deciduous forest.

PINACEAE

Abies balsamea (L.) Mill X Abies lasiocarpa (Hook.) Nutt

Widespread, very abundant; dominant in canopy of subhygric - submesic coniferous forests, particularly in older stands, lower canopy species in younger stands.

Larix laricina (Du Roi) K. Koch

Local, scarce; strings in patterned fens, treed swamp.

Picea engelmannii Parry X Picea glauca (Moench) Voss

Widespread, very abundant; dominant in canopy of submesic - subhygric coniferous forests.

Picea mariana (Mill.) B.S.P.

Widespread, very abundant; dominant in canopy of hygric coniferous forests, bogs.

Pinus contorta Loudon

Widespread, abundant; part of canopy in subhygric - submesic coniferous forests, establishes rapidly after fire.

TYPHACEAE

Typha latifolia

Local, scarce; edge of pond at base of sandstone cliff.

POTAMOGETONACEAE

Potamogeton alpinus Balbis

Local, scarce; in beaver pond.

SPARGANIACEAE

Sparganium angustifolium Michx.

Local, scarce; beaver pond in slump area.

* Sparganium minimum (Hortm.) Fries

Local, scarce; wet pool in low-sedge fen.

JUNCAGINACEAE

Scheuchzeria palustris L.

Local, scarce; flark-string transition in patterned fen.

POACEAE

Agropyron trachycaulum (Link) Malte

Scattered, scarce; subhygric balsam poplar woodland, riverine herb meadow.

Agrostis scabra Willd.

Scattered, scarce; riverine herb meadows and shrublands, hygric open coniferous forest.

Agrostis stolonifera L.

Local, very scarce; eroding exposed bedrock slope.

Alopecurus aequalis Sobol.

Local, very scarce; moist site on cutline.

Beckmannia syzigachne (Steud.) Fern.

Local, very scarce; wet site on cutline.

Bromus canadensis Michx.

Scattered, occasional - abundant; riverine herb meadows, low shrubland and alder thicket.

* Bromus inermis Leyss. ssp. pumpellianus (Scribn.) Wagnon

Local, very scarce; mesic site on cutline.

Calamogrostis canadensis (Michx.) Beauv.

Widespread, abundant - very abundant; mesic-hygric coniferous forest, seepage herb and shrub communities, subhygric balsam poplar woodland, riverine herb meadows, low shrublands and alder swamps, subxeric meadow, edge of seepage pool, perched marsh.

* Calamagrostis neglecta (Ehrh.) Gaertn., Mey and Scherb.

Local, scarce; recent burn, mesic site on cutline.

Cinna latifolia (Tres.) Griseb.

Scattered, occasional - abundant; seepage herb and shrub communities, subhygric balsam poplar woodland.

Elymus innovatus Beal

Local, occasional - abundant; mesic deciduous forest, subxeric meadow.

* Festuca saximontona Rydb.

Local, very scarce; mesic deciduous forest.

* Glyceria borealis (Nash) Batch.

Local, scarce; edge of small pool.

* Glyceria striata (Lam.) Hitchc.

Scattered, occasional; edge of seepage pool, riverine alder swamp.

* Oryzopsis asperifolia Michx.

Local, occasional; submesic coniferous forest.

Phleum commutatum Gaudin

Scattered, scarce; riverine herb meadows, edge of seepage pool.

* Poa pratensis L.

Scattered, occasional; riverine herb meadows and low shrub lands, seepage herb and shrub communities, deciduous woodland, subxeric meadow.

* Schizachne purpurascens (Torr.) Swallen

Scattered, occasional; subhygric balsam poplar woodland, mesic open deciduous forest, riverine herb meadow.

* Trisetum spicatum (L.) Richter

Local, scarce; riverine herb meadow; moist site on cutline, base of eroding sandstone slope, eroding bank of Goose River.

CYPERACEAE

Carex aquatilis Wahl.

Scattered, abundant - very abundant; dominant in tall sedge fens, riverine herb meadows and low shrublands.

Carex bebbii (Bailey) Fern.

Local, very scarce; mesic site on cutline.

Carex brunnescens (Pers.) Poir.

Scattered, occasional - abundant; hygric coniferous forests, riverine fens and hygric low shrublands, low sedge fens.

Carex canescens L. (C. curta Good)

Scattered, occasional - abundant; hygric coniferous forest, riverine swamp, and hygric low shrubland, species-poor seepage herb community.

Carex concinna R. Br.

Local, scarce; submesic sandstone slope.

* Carex deflexa Hornem

Local, scarce; hygric, recently burned coniferous forest, seepage herb community, disturbed roadside, eroding bedrock slope with seeps.

Carex deweyana Schw.

Local, very scarce; mesic balsam poplar woodland.

* Carex disperma Dewey

Scattered, occasional; hygric coniferous forests, black spruce bog, seepage herb and shrub communities, riverine herb meadows and coniferous woodland.

* Carex gynocrates Wormskjold

Local, very scarce; flark in patterned fen.

Carex heleonastes Ehrh.

Local, very scarce; flark-string interface in patterned fen.

Carex houghtonii Torr.

Local, scarce; eroding sandstone slope, disturbed drill site.

Carex interior Bailey

Local, occasional; low-sedge fen.

* Carex leptalea Wahl.

Local, very scarce; wet site on cutline.

Carex limosa L.

Widespread, abundant; fens and bogs.

* Carex loliacea L.

Scattered, occasional; riverine swamps and coniferous woodlands, seepage herb and shrub communities.

* Carex media R. Br. (Carex norvegica Retz.)

Local, scarce; riverine coniferous woodland, hydric open coniferous forest.

Carex pachystachya Cham.

Local, scarce; riverine herb meadows, seepage herb and shrub community, mesic site on cutline.

Carex pauciflora Lightf.

Scattered, ocasional - abundant; black spruce bogs, fens.

Carex paupercula Michx. (Carex magelianica Lamarck)

Scattered, occasional; bogs, fens, treed swamp, riverine hygric low shrubland.

* Carex praticola Rydb.

Local, scarce to occasional; riverine mesic herb meadows and low shrublands, subxeric meadow.

Carex rossii Boott.

Local, scarce; seepage herb community.

Carex rostrata Stokes

Scattered, occasional - abundant; fens, treed swamp, riverine herb meadow.

Carex scirpoidea Michx.

Local, very scarce; small patterned fen.

Carex siccata Dewey

Local, very scarce; open grassy ridge crest.

Carex tenuiflora Wahl.

Local, very scarce; low sedge fen.

Carex trisperma Dewey

Local, very scarce; bog, hygric black spruce forest.

Eriophorum angustifolium Honcheny (E. polystachian L.)

Local, scarce; bog, low sedge fen.

* Eriophorum brachyantherum Trautu.

Local, scarce; streamside fen.

* Eriophorum chamissonis Meyer

Scattered, occasional - abundant; fens, bogs.

Eriophorum vaginatum L.

Local, occasional; bogs, fens.

* Scirpus cespitosus L.

Local, very scarce; string of large patterned fen.

Scirpus microcarpus Presl.

Local, very scarce; wet site on cutline.

LEMNACEAE

Lemna minor L.

Local, very scarce; beaver pond.

JUNCACEAE

Juncus bufonis L.

Local, very scarce; wet site on cutline.

Juncus castaneus J. L. Smith

Local, scarce; clay bank of East Prairie Creek, wet site on cutline.

Juncus stygius L.

Local, scarce - occasional; flark-string interface of small patterned fen, low sedge fens.

Juncus tenuis Willd.

Local, very scarce; wet site on cutline.

Luzula parviflora (Ehrh.) Desu.

Widespread, scarce - occasional; mesic-hygric coniferous forest, swamps, riverine mesic low shrubland and coniferous woodland.

LILIACEAE

Maianthemum canadense Desf.

Scattered, scarce - occasional; subhygric-submesic coniferous forest, subxeric meadow.

Smilacina stellata (L.) Desf.

Local, very scarce; riverine herb meadow.

Smilacina racemosa (L.) Desf.

Local, scarce; subhygric coniferous forest (herb rich phase).

Smilacina trifolia (L.) Desf.

Widespread, scarce - occasional; fens, bogs, hygric coniferous forests, swamps.

Streptopus amplexifolius (L.) DC.

Widespread, scarce - occasional; submesic-subhygric coniferous forest, subhygric balsam poplar woodland.

IRIDACEAE

* Sisyrinchium montanum Greene

Local, very scarce; mesic site on cutline.

ORCHIDACEAE

Corallorhiza trifida Chat.

Local, scarce; eroding bedrock slope with seeps, seep in hygric open coniferous forest.

Habenaria hyperborea (L.) R. Br.

Local, very scarce; edge of beaver pond.

Habenaria obtusata (Pursh) Richards.

Local, very scarce; seep in hygric open coniferous forest.

Listera cordata (L.) R. Br.

Local, scarce; mesic coniferous - feathermoss forest.

Spiranthes romanzoffiana Cham.

Local, scarce; low sedge fens; hygric coniferous forest.

SALICACEAE

Populus tremuloides Michx.

Scattered, occasional - abundant; submesic-subxeric, well-drained valley slopes.

Populus balsamifera L.

Local, occasional - very abundant; subhygric-submesic valley slopes and bottoms, probably unstable sites due to seepage and slumping.

Salix bebbiana Sarg.

Scattered, abundant; seepage herb and shrub communities, mesic coniferous forest, thickets on cutline.

Salix commutata Bebb

Local, scarce; riverine low shrub land.

* Salix discolor Muhl.

Scattered, occasional; subhydric black spruce-larch woodland, base of eroding bedrock slope, mesic coniferous forest.

* Salix lutea Nutt.

Local, very scarce; bare open slope.

* Salix mackenzieana (Hook.) Burratt (S. prolixa Anderss, S. rigida Muhl.)

Scattered, ocasional - abundant; mesic coniferous forest, riverine low shrublands.

Salix myrtillifolia Anderss.

Local, scarce; streamside fen.

Salix pedicellaris Pursh

Scattered, occasional - abundant; fens.

Salix planifolia Pursh

Scattered, occasional - abundant; riverine swamps and low shrublands, seepage shrub community.

* Salix pyrifolia Andersson

Scattered, scarce - abundant; hygric coniferous forest, sites of recent burns, treed swamp.

Salix scouleriana Barratt

Local, occasional; subhygric balsam poplar woodland, seep in open coniferous forest.

Salix subcoerulea Piper (S. drummondiana var. subcoerulea [Piper] Ball.)

Local, occasional; hygric riverine low shrubland, base of bare, open slope.

BETULACEAE

Alnus crispa (Ait.) Pursh

Scattered, abundant - very abundant; seepage shrub communities, post-fire mesic coniferous forest, subhygric balsam poplar woodland.

Alnus rugosa (Du Roi) Spring (A. tenuifolia Nutt.)

Scattered, occasional - very abundant; seepage shrub communities, swamps, subhygric-hygric coniferous forest.

Betula glandulosa Michx.

Widespread, occasional - abundant; bogs, fens, hygric coniferous forests; riverine low shrublands.

* Betula papyrifera Marsh

Local, scarce; mesic mixed coniferous - deciduous woodland at base of slope.

URTICACEAE

Urtica dioica L. var. gracilis

Scattered, occasional; characteristic species of seepage herb and shrub communities.

SANTALACEAE

Geocaulon lividum (Richards.) Fern

Scattered, scarce; submesic - subhygric coniferous forest, mesic deciduous forest.

POLYGONACEAE

Rumex occidentalis Wats.

Scattered, scarce; riverine herb meadows and swamps, seepage herb and shrub communities.

CARYOPHYLLACEAE

* Arenaria lateriflora L. [Moehringia lateriflora (L.) Fenzl.]

Local, very scarce; subhygric balsam poplar woodland.

Stellaria calycantha (Ledeb.) Bong.

Scattered, occasional; edge of seepage pools, subhygric post-fire coniferous forest.

* Stellaria crispa Cham. & Schecht.

Local, scarce; subhygric balsam poplar woodland, edge of seepage pool.

Stellaria longifolia Muhl.

Scattered, scarce; riverine swamps, low shrublands and herb meadows, hygric coniferous forest.

* Stellaria longipes Goldie

Scattered, scarce; subxeric meadow, moist site on cutline.

RANUNCULACEAE

Aquilegia brevistyla Hook.

Local, very scarce; mesic deciduous forest, subxeric meadow.

Actaea rubra (Ait.) Willd.

Scattered, scarce - occasional; subhygric - mesic coniferous forest (herb rich phase), subhygric balsam poplar woodland, mesic deciduous forest.

Caltha palustris L.

Local, abundant; fen - swamp integrade.

Coptis trifolia (L.) Solisb.

Scattered, scarce - occasional; mesic - subhygric coniferous - feathermoss forest.

Delphinium glaucum S. Wats.

Widespread, scarce - occasional; seepage herb and shrub communities, subhygric balsam poplar woodland, riverine herb meadows and low shrubland.

Ranunculus circinatus Sibth.

Local, occasional; in beaver pond.

Ranunculus gmelinii D.C.

Local, scarce; emergent in 0.5 m water at pool edge.

Ranunculus lapponicus L.

Local, occasional; treed swamps, along drainage in coniferous forest.

Thalictrum occidentale Gray

Scattered, scarce - occasional; subhygric - mesic coniferous forest (herb rich phase), seepage herb communities.

Thalictrum sparsiflorum Turez.

Local, scarce; hygric riverine low shrubland, seepage shrub community, edge of seep pool.

Thalictrum venulosum Trel.

Local, occasional; riverine herb meadows and low shrublands.

FUMARIACEAE

* Corydalis sempervirens (L.) Pers.

Local, very scarce; base of bare, open slope.

BRASSICACEAE

Cardamine pensylvanica Muhl.

Scattered, scarce; bare soil at edge of pools.

* Rorripa islandica (Oeder) Borbas (R. palustris [L.] Berser)

Local, scarce; mesic site on cutline.

Thlaspi arvense L. (introduced)

Local, scarce; disturbed site.

DROSERACEAE

Drosera anglica Huds.

Local, occasional; low sedge fen.

SAXIFRAGACEAE

Chrysosplenium iowense Rydb.

Scattered, scarce; seepage herb communities.

Mitella nuda A. Gray

Widespread, scarce - occasional; seepage herb and shrub communities, subhygric balsam poplar woodland, river valley coniferous forest.

Mitella pentandra Hook.

Local, very scarce; seep in hygric coniferous woodland.

Parnassia palustris L.

Local, scarce; riverine subhygric coniferous woodland, seep in hygric coniferous woodland.

Ribes glandulosum Grauer

Widespread, occasional; submesic - subhygric coniferous forest, seepage herb and shrub communities, subhygric balsam poplar woodland.

Ribes hudsonianum Richards

Local, scarce; hygric coniferous - feathermoss forest, seepage area.

Ribes lacustre (Pers.) Poir.

Widespread, scarce - occasional; subhygric - submesic coniferous forest, seepage herb and shrub communities, subhygric balsam poplar woodland, riverine swamps and coniferous woodlands.

Ribes triste Pall.

Local, scarce; hygric coniferous forest on valley slope.

Tiarella trifoliata L.

Widespread, occasional; mesic - subhygric coniferous forest.

ROSACEAE

Fragaria virginiana Duchesne

Scattered, scarce - occasional; subhygric balsam poplar woodland, mesic open deciduous forest, riverine herb meadows, low shrublands and coniferous woodlands, subxeric meadow.

Geum macrophyllum Willd.

Widespread, scarce - occasional; riverine herb meadows, low shrublands and swamps, seepage herb and shrub communities.

Geum rivale L.

Scattered, scarce - occasional; riverine swamps and coniferous woodland, seepage herb and shrub communities.

Potentilla norvegica L.

Local, very scarce; mesic site on cutline.

* Potentilla palustris (L.) Scop.

Scattered, scarce - occasional; riverine swamps and fens.

Potentilla tridentata Ait.

Local, very scarce; mesic site on cutline.

Rosa acicularis Lindl.

Widespread, scarce - occasional; seepage herb and shrub communities, subhygric - mesic coniferous forest (herb rich phase), riverine coniferous woodlands.

Rubus acaulis Michx. (Rubus arcticus L.)

Scattered, scarce - occasional; riverine low shrublands, swamps and coniferous woodlands.

Rubus chamaemorus L.

Widespread, occasional - abundant; hygric coniferous forests, bogs, patterned fens, treed swamp, riverine low shrublands.

Rubus idaeus L. var. strigosus (Michx.) Maxim.

Widespread, occasional - abundant; seepage herb and shrub communities, subhygric balsam poplar woodland, subhygric-mesic coniferous forest (herb rich phase), post-fire mesic coniferous forest, subxeric meadow.

* Rubus pedatus J. E. Smith

Widespread, occasional - abundant; submesic - hygric coniferous forest.

Rubus pubescens Raf.

Scattered, scarce - occasional; seepage herb and shrub communities, subhygric balsam poplar woodland, mesic coniferous forest.

Sorbus scopulina Greene

Scattered, scarce - occasional; submesic - subhygric coniferous forests (feathermoss phases).

FABACEAE

* Hedysarum boreale Nutt.

Local, very scarce; eroding sandstone slope.

Lathyrus ochroleucus Hook.

Local, scarce; riverine mesic herb meadow, subxeric meadow.

Medicago sativa L. (introduced)

Local, scarce; disturbed site.

Oxytropis deflexa (Pall.) DC.

Local, very scarce; eroding sandstone slope.

Vicia americania

Local, very scarce; riverine mesic herb meadow.

Trifolium hybridum L. (introduced)

Local, scarce; moist site on cutline.

GERANIACEAE

Geranium richardsonii Fisch. and Trautv.

Local, scarce; mixed deciduous - coniferous forest, moist site on cutline.

EMPETRACEAE

Empetrum nigrum L.

Scattered, scarce - occasional; hygric coniferous forests, bog.

ELATINACEAE

Elatine triandra Schk.

Local, scarce; small pools.

BALSAMINACEAE

* Impatiens capensis Meerb.

Local, scarce; seepage herb and shrub communities.

VIOLACEAE

* Viola palustris L.

Scattered, scarce - occasional; riverine swamps and hygric low shrublands, treed swamp, edge of seepage pool.

Viola renifolia Gray

Local, scarce; seepage herb community, mesic deciduous forest.

OLEACEAE

Shepherdia canadensis (L.) Nutt.

Local, abundant; mesic open deciduous forest, eroding sandstone slope.

ONAGRACEAE

Circaea alpina L.

Local, very scarce; subhygric coniferous forest (herb rich).

Epilobium angustifolium L.

Widespread, scarce - abundant; subhygric - submesic coniferous forests, seepage herb and shrub communities, subhygric balsam poplar woodland, mesic deciduous forest, riverine herb meadows, low shrublands and coniferous woodlands, subxeric meadow.

* Epilobium ciliatum Raf.

Scattered, scarce-occasional; seepage herb and shrub communities, riverine hygric low shrubland, edge of seepage pools.

Epilobium hornemannii Reichenb.

Scattered, scarce; seepage herb communities.

Epilobium lactiflorum Hausskn.

Local, scarce; fens.

Epilobium palustre L.

Local, scarce; fen, riverine low shrubland, treed swamp.

HUPPURIDACEAE

* Hippuris vulgaris L.

Local, scarce; beaver pond.

ARALIACEAE

Aralia nudicaulis L.

Local, scarce - occasional; subxeric meadow, subxeric coniferous woodland.

Oplopanax horridum (Sm.) Miq.

Local, very scarce; seepage shrub community.

APIACEAE

Angelica genuflexa Nutt.

Local, very scarce; seep in hygric coniferous woodland.

Heracleum lanatum Michx.

Scattered, scarce - abundant; seepage herb and shrub communities, subhygric balsam poplar woodland, subhygric coniferous forest, riverine swamp and coniferous woodland.

Osmorhiza depauperata Phil.

Scattered, scarce - occasional; subhygric balsam poplar woodland, mesic coniferous forest.

Cornus canadensis L.

Widespread, occasional - abundant; submesic - hygric coniferous forest, seepage herb and shrub communities, subxeric meadow.

PYROLACEAE

Moneses uniflora (L.) Gray

Scattered, scarce; mesic-subhygric coniferous forest (Rupe-Vame phase).

Pyrola asarifolia Michx.

Scattered, scarce - occasional; submesic - subhygric coniferous forest, subhygric balsam poplar woodland.

Pyrola minor L.

Local, scarce; treed swamp, riparian subhygric coniferous woodland, low sedge fen.

Pyrola secunda L. (Orthilia secunda [L.] House)

Scattered, scarce - occasional; submesic - subhygric coniferous forest, treed swamp.

Pyrola virens Schweigger (P. chlorantha Sw.)

Local, scarce; mesic, mid slope coniferous forest (Coca, Gydr, Libo phase).

ERICACEAE

* Andromeda polifolia L.

Widespread, scarce - occasional; bogs, fens.

Arctostaphylos uva-ursi (L.) Spreng.

Local, very scarce; submesic coniferous forest.

Gaultheria hispidula (L.) Muhl.

Widespread, scarce - occasional; subhygric - hygric coniferous forests.

Kalmia microphylla (Hook.) Keller

Widespread, scarce - occasional; bogs, low sedge fens, hygric coniferous forest.

Ledum groenlandicum Oeder

Widespread, occasional - very abundant; bogs, tall sedge fen, mesis - hygric coniferous forest (phases with thick bryoid layer).

Oxycoccus microcarpus Turcz.

Scattered, scarce; bogs, fens, hygric coniferous forest.

Rhododendron albiflorum Hook.

Local, occasional - abundant; mesic - subhygric, mid-slope coniferous forest.

Vaccinium caespitosum Michx.

Local, scarce; subhygric coniferous forest.

Vaccinium membranaceum Dougl.

Widespread, occasional - abundant; submesic - subhygric coniferous forests, mesic deciduous forest.

Vaccinium myrtilloides Michx.

Widespread, occasional - very abundant; submesic - hygric coniferous forests.

Vaccinium vitis-idaea L.

Widespread, scarce - occasional; submesic - hygric coniferous forests (expect Coca - Gydr-Libo phase), bogs.

PRIMULACEAE

Trientalis europea (Borealis) L.

Local, scarce; post-fire submesic coniferous forest, seepage herb community, disturbed site.

GENTIANACEAE

Gentianella amarella (L.) Borner (Gentiana amarella L.)

Local, very scarce; eroding sandstone slope.

Halenia deflexa (Sm.) Griseb.

Local, scarce; seeps at base of eroding sandstone slopes.

Menyanthes trifoliata L.

Scattered, occasional - abundant; fens, bog, hygric coniferous forest.

BORAGINACEAE

Mertensia paniculata (Ait.) G. Don

Widespread, scarce - occasional; seepage herb and shrub communities, subhygric balsam poplar woodland, riverine herb meadows, low shrublands and coniferous woodlands, subxeric meadow.

LAMNIACEAE

Galeopsis tetrahit L. (introduced)

Local, scarce; disturbed site.

SCROPHULARIACEAE

Pedicularis groenlandica Retz.

Local, very scarce; low sedge fen.

Pedicularis labradorica Wirsing

Scattered, scarce - occasional; submesic coniferous forest, fen, mesic site on cutline.

Pedicularis parviflora Sm.

Local, very scarce; low sedge fen.

* Penstemon procerus Dougl.

Local, occasional; riverine herb meadow.

* Rhinanthus crista - galli L. (R. minor L.)

Local, scarce; mesic site on cutline.

Veronica alpina L. var. unalaschensis C. & S.

Local, scarce; mesic site on cutline, disturbed roadside.

Veronica americana Schwein.

Scattered, scarce - abundant; seepage herb communities, swamp.

* Veronica serpyllifolia L.

Local, scarce; cutline in seepage area.

PLANTAGINACEAE

Plantago major L.

Scattered, scarce; moist sites in disturbed areas.

RUBIACEAE

Galium boreale L.

Local, scarce; riverine herb meadows.

Galium trifidum L.

Local, scarce; riverine swamp and fen.

Galium triflorum Michx.

Scattered, scarce; seepage herb and shrub communities; subhygric coniferous forest (herb rich phase).

CAPRIFOLIACEAE

Linnaea borealis L.

Widespread, scarce - occasional; submesic - subhygric coniferous forests.

Lonicera involucrata (Richards.) Bands

Widespread, scarce - occasional; seepage herb and shrub communities, subhygric balsam poplar woodland, mesic - subhygric coniferous forests, riverine hygric low shrubland and coniferous woodland.

* Symphoricarpos albus L.

Local, abundant; subxeric meadow.

Sambucus racemosa L.

Scattered, scarce - occasional; mesic - subhygric coniferous forests, seepage herb and shrub communities.

Viburnum edule (Michx.) Raf.

Scattered, occasional; seepage shrub communities; subhygric balsam poplar woodland, mesic open deciduous forest, subhygric - mesic coniferous forest.

VALERIANACEAE

* Valeriana dioica L.

Local, scarce; streamside fen, hygric riverine meadow.

ASTERACEAE

Achillea millefolium L.

Scattered, scarce; riverine herb meadows, low shrublands, swamps and coniferous woodland, submesic coniferous forest.

Achillaea sibirica Ledeb.

Local, scarce; mesic site on cutline.

* Agoseris glauca (Pursh) Raf.

Local, very scarce; post-fire hygric coniferous forest.

Antennaria neglecta Greene (A. neodioica Greene)

Local, scarce; submesic coniferous forest, subxeric site on cutline.

Antennaria rosea Greene var. nitida (Greene) Breitung

Local, scarce; submesic coniferous forest, subxeric meadow, subxeric site on cutline.

Arnica chamissonis Less.

Local, scarce; riverine herb meadows, eroding bedrock slope.

Arnica cordifolia Hook.

Scattered, scarce - occasional, mesic - subhygric coniferous forests, subhygric balsam poplar woodland, seepage herb communities.

* Arnica latifolia Bong. (may be A. cordifolia)

Local, very scarce; mesic coniferous woodland.

Aster ciliolatus Lindl.

Scattered, scarce - occasional; subhygric balsam poplar woodland, mesic open deciduous forest, seepage herb community, riparian herb meadows and mesic low shrublands, submesic coniferous forest.

Aster modestus Lindl.

Local, scarce - occasional; riparian herb meadows and mesic low shrublands, seepage herb and shrub communities, subxeric meadow.

Cirsium foliosum (Hook.) DC.

Local, scarce; riparian herb meadows.

Crepis tectorum L. (introduced)

Local, scarce; disturbed site.

Erigeron acris L.

Local, very scarce; moist site on cutline.

Erigeron asper Nutt.

Local, very scarce; bare stream bank.

Erigeron philadelphicus L.

Local, very scarce; seep at base of eroding slope.

Hieracium albiflorum Hook.

Local, very scarce; moist site on cutline.

Hieracium scabriusculum Schwein (H. umbellatum L.)

Scattered, scarce; post-fire hygric coniferous forest, mesic deciduous forest, mesic site on cutline.

Hieracium triste Willd. (H. gracile Hook.)

Scattered, scarce; submesic - mesic coniferous forest, mesic sites on cutlines.

Petasites palmatus (Ait.) Gray

Widespread, scarce - occasional; submesic - subhygric coniferous forest, subhygric balsam poplar woodland, seepage herb and shrub communities, riparian herb meadow.

Petasites sagittatus (Pursh) A. Gray

Local, scarce; treed swamp, seepage mixed woodland.

* Senecio indecorus Greene

Scattered, scarce; on beaver dam, base of slump, mesic site on cutline.

* Senecio streptanthifolius Greene

Local, very scarce; subhygric balsam poplar woodland.

Senecio triangularis Hook.

Widespread, occasional, seepage herb and shrub communities, subhygric balsam poplar woodland, treed swamp; riparian low shrubland, subxeric meadow.

Solidago canadensis L.

Local, very scarce; moist site on cutline.

* Solidago gigantea Ait.

Local, occasional; riverine herb meadow and mesic low shrubland.

Vascular Plant Species Present in the Western Swan Hills But Not Reported in This Study (30 Species)

Lycopodium annotinum L. - moist woods

Lycopodium selago L. - open woods

Lycopodium sitchense Rupr. - open woods

Isoetes echinospora Dur. - ponds and lakes

Botrychium virginianum (L.) Sw. - moist woodlands and thickets

Phegopteris connectilis (Michx.) Fee - moist woodlands

Hordeum jubatum L. - disturbed sites

Poa palustris L. - moist meadows and open woods

Carex aenea Fern. - dry places and open woods

Luzula acuminata Raf. - disturbed moist woodland

Streptopus streptopoides (Ledeb.) Frye and Rigg - coniferous woodlands

Calypso bulbosa (L.) Oakes - coniferous forests

Listera borealis Morong - mossy woods, moist meadows

Salix arbusculoides Anderss. - streambanks, floodplains, fens, bogs

Rumex triangulivalvis (Dans.) Rech. - moist open ground

Ranunculus abortivus L. - open woods, stream banks

Ranunculus uncinatus D. Don - moist, shaded woodland

Erysimum cheiranthoides L. - disturbed ground

Chrysosplenium tentandrum - moist, shady banks and ledges

Prunus pensylvanica L.f. - woods and clearings, often dry

Astragalus americanus (Hook.) M. E. Jones - stream banks and moist woods

Callitriche verna L. - ponds and streams

Viola adunca J. E. Smith - grassland and open woods

Viola canadensis L. - moist woods and meadows

Epilobium leptocarpum Hausskn. - moist open stony slopes

Chamaedaphne calyculata (L.) Moench - bogs and ponds

Stachys palustris L. - wet meadows, moist open woods

Castilleja miniata Dougl. ex Hook. - open woods and meadows

Erigeron elatus Hook. - marshy ground

Senecio pauperculus Michx. - moist meadows, shores, open woods

SOURCE: Packer 1983

Appendix B

ANNOTATED NON-VASCULAR PLANT SPECIES LIST

Mosses (45 Species)

Aulacomnium palustre (Hedw.) Schwaegr.

Common; on soil, humus and hummocks, bogs; fens; hygric coniferous forests.

Brachythecium sp.

Occasional; on soil and wood, seepage herb and shrub communities.

Brachythecium rivulare B.S.G.

Scarce; on wet soil, seepage pool.

Brachythecium salebrosum (W. & M.) Bry. Eur.

Occasional; on soil and wood, riverine coniferous forest.

Brachythecium starkei (Brid.) Bry. Eur.

Occasional; on soil and wood, seepage herb and shrub communities.

Bryum pseudotriquetrum (Hedw.) Gaertn., Meyer and Scherb.

Scarce; on wet soil, seepage pool.

Campyllium stellatum (Hedw.) L. & Jens

Occasional; on hummocks, fens; hygric coniferous forest.

Campyllium polygamum (Bry. Eur.) Bryhn

Occasional; soil or humus, riverine hygric low shrubland.

Climacium dendroides (Hedw.) Web. & Mohr.

Occasional; on wet soil, riverine shrub and herb communities.

Dicranum fuscescens Turn.

Common; on wood or soil, mesic - subhygric coniferous forests.

Drepanocladus aduncus (Hedw.) Warnst.

Occasional; shallow water, edge of beaver pond; seepage pool.

Drepanocladus exannulatus (Guemb.) Wornst.

Occasional; shallow water, fens.

Drepanocladus uncinatus (Hedw.) Warnst.

Scarce; on wet soil, riverine shrub communities.

Philonotis fontana (Hedw.) Brid.

Occasional; on wet soil, seepage pools and riverine shrub communities.

Plagiomnium ellipticum (Hook.) Sull.

Occasional; on soil and wood, swamps; seepage pools.

Plagiomnium medium B.S.G.

Occasional; on soil or wood, seepage herb and shrub communities, hygric coniferous forest.

Plagiothecuim laetum B.S.G.

Scarce; on soil or wood, seepage shrub community.

Pleurozium schreberi (Brid.) Mitt.

Very common; on soil and humus, hygric - mesic coniferous forests; bogs.

Pholia nutans (Hedw.) Lindb.

Occasional; on rotting wood, hygric - mesic coniferous forest.

Polytrichum commune Hedw.

Very common; on soil or humus, bogs; hygric coniferous forests.

Polytrichum strictum Brid.

Common; on humus and Sphagnum hummocks, bogs; hygric coniferous forests.

Ptilidium pulcherrimum (Web.) Hampe

Occasional; on wood, mesic - subhygric coniferous forests.

Ptilium crista - castrensis (Hedw.) De Not.

Very common; on humus, hygric - submesic coniferous forests.

Rhizomnium magnifolium (Horik.) Kop.

Scarce; soil and humus, subhydric open coniferous forest (seep).

Rhizomnium pseudopunctatum (Bruch. & Schimp.) Kop.

Scarce; soil and humus; seepage herb community; riverine low shrubland.

Sphagnum angustifolium (Jens & Russ.) Jens.

Very common; forms hummocks, bogs; fens; hygric coniferous forests.

Sphagnum fuscum (Schimp.) Klinggr.

Occasional; on top of hummocks, bogs; fens; hygric coniferous forest.

Sphagnum girgensohnii Russ.

Occasional; on hummocks, mesic coniferous forests (with feathermosses); bog.

Sphagnum jensenii Lindb.

Occasional; submerged in water, fens.

Sphagnum magellanicum Brid.

Very common; forming hummocks, bogs; fens.

Sphagnum majus (Russ.) C. Jens.

Scarce; on hummocks, fen.

Sphagnum nemoreum Scop.

Occasional; forming hummocks (with feathermosses), mesic - hygric coniferous forests.

Sphagnum riparium Angstr.

Occasional; on tops of hummocks, hygric coniferous forest; fen.

Sphagnum russowii Warnst.

Occasional; on hummocks (with feathermosses), hygric coniferous forest.

Sphagnum squarrosum Crome

Scarce; on wet soil or humus, treed swamp.

Sphagnum teres (schimp.) Angstr. ex Hartm.

Scarce; on wet soil or humus, treed swamp.

Sphagnum warnstorfii Russ.

Occasional; on soil or humus, hygric coniferous forests; riverine low shrub lands and alder swamps.

Splachnum luteum Hedw.

Scarce; on dung, edge of bog.

Splachnum rubrum Hedw.

Scarce; on dung, edge of bog.

Splachnum sphaericum Hedw.

Scarce; on dung, edge of bog.

Tetraplodon angustatus (Hedw.) B.S.G.

Scarce; on moose antler in mesic coniferous forest.

Tetraplodon mnioides (Hedw.) B.S.G.

Scarce; on moose antler in mesic coniferous forest.

Thuidium abietinum (Brid.) Bry. Eur.

Scarce; on soil, mesic open deciduous forest.

Timmia austriaca Hedw.

Scarce; soil, humus or wood, riverine subhygric coniferous forest.

Tomenthypnum falcifolium Hedw. (Ren. ex Nich.)

Common; on tops of hummocks, fens; bogs.

Liverworts (Six species)

Barbilophozia lycopodioides (Wallr.) Loeske

Scarce; on soil or humus, seepage herb community.

Lophozia porphyroleuca (Nees) Schiffn.

On soil or wood; subhygric - mesic coniferous forest.

Lophozia ventricosa (Dicks.) Dumort

Occasional; on soil or wood, subhygric - mesic coniferous forest.

Marchantia polymorpha L.

On soil, seepage herb and shrub communities, swamps.

Scapania paludicola Lueske and K. Miill

Scarce; submerged in shallow water, bog.

Scapania undulata (L.) Dumort.

Submerged in shallow water, low sedge fen.

Lichens (39 Species)

Alectoria sarmentosa (Ach.) Ach.

Epiphyte on fir/spruce; coniferous forests.

Bryoria fremontii (Tuck.) Brodo and D. Hawksw.

On bark; coniferous forests.

Bryoria fuscescens (Gyeln.) Brodo and D. Hawksw.

On bark; coniferous forests.

Cetraria halei Culb.

On bark; coniferous forests.

Cetraria nivalis (L.) Ach.

On rock; rock slide.

Cetraria pinastri (Scop.) S. Gray

Base of conifers in coniferous forests.

Cladina mitis (Sandst.) Hale and W. Culb.

On soil and humus in mesic - subhygric coniferous forests; on rock slide.

Cladina rangiferina (L.) Harm.

On soil and humus in mesic - subhygric coniferous forest.

Cladonia amaurocraea (Florke) Schaer.

On rock; exposed cobble slopes.

Cladonia cenotea (Ach.) Schaer.

On soil, humus or rotten wood.

Cladonia chlorophaea (Flk.) Spreng

On soil and bases of trees; coniferous forests.

Cladonia coccifera (L.) Willd.

On soil and humus over rocks.

Cladonia coniocraea (Flk.) Spreng.

On humus and rotting wood; coniferous forests.

Cladonia cornuta (L.) Hoffin.

Soil, humus, wood; coniferous forests and exposed cobble slope.

Cladonia crispata (Ach.) Flot.

On soil or over mosses; exposed cobble slope; recent burn.

Cladonia deformis (L.) Hoffin.

On humus and rotting wood; open areas.

Cladonia gonecha (Ach.) Asah.

On humus and rotting wood; openings in coniferous and deciduous forests.

Cladonia gracilis (L.) Willd.

On soil, humus and mosses; rockslide and coniferous forests.

Cladonia phyllophora (Ehrh.) Hoffm.

On rocks; rockslide.

Evernia mesomorpha Nyl.

On conifers; coniferous forests.

Hypogymnia bitteri (Lynge) Ahti

On conifers; coniferous forests.

Hypogymnia physodes (L.) Nyl.

On conifers; coniferous forests.

Leptogium saturninum (Dicks.) Nyl.

On rocks; exposed cobble slope.

Parmelia centrifuga (L.) Ach.

On rocks; exposed cobble slope.

Parmelia sulcata Tayl.

On trees; mesic - sub ic coniferous forests.

Parmeliopsis ambigua (Wulf.) Nyl.

On trees; coniferous forests.

Parmeliopsis hyperoptera (Ach.) Arn

On conifers; coniferous forests.

Peltigera aphthosa (L.) Willd.

On soil and over mosses; coniferous forests.

Peltigera canina (L.) Willd.

On soil and over mosses; exposed cobble slope.

Peltigera malacea (Ach.) Funck.

On mosses; coniferous forest.

Peltigera rufescens (Weiss) Humb.

On humus and mosses; coniferous forests.

Platismatia glauca (L.) Culb. and Culb.

On conifers; mesic - subhygric coniferous forests.

Rhyzocarpon geographicum (L.) B.C.

Rocks; exposed cobble slope.

Rhyzocarpon superficiale

Rocks; exposed cobble slope.

Solorina saccata (L.) Ach.

On soil; eroding bedrock slope.

Umbilicaria hyperborea (Ach.) Ach.

On rocks; exposed cobble slope.

Usnea alpina Mot.

On conifers; coniferous forests.

Usnea sorediifera (Arr.) Lynge

On conifers; coniferous forests.

Usnea subfloridana Stirt.

Fir bark; coniferous forests.

Appendix C

VEGETATION PLOT DESCRIPTIONS

VEGETATION STAND TABLE

NATURAL AREAS PROGRAM--ALBERTA ENERGY AND NATURAL RESOURCES

THIS TABLE CONTAINS 241 SPECIES IN 72 PLOTS

VEGETATION PLOT NUMBER	CB83 001	CB83 002	CB83 003	CB83 004	CB83 005	CB83 006	CB83 007	CB83 009	CB83 010	CB83 011	CB83 013	CB83 014	CB83 015	CB83 016	CB83 017	CB83 018	CB83 019	CB83 021	CB83 022	CB83 023
PROJECT IDENTIFICATION	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM T4	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN
LEGAL	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5
BIOGEOGRAPHICAL ZONE																				
IBP CODE																				
VEGETATION TYPE																				
LANDFORM																				
ELEVATION (M)																				
SLOPE (DEGREES)	10	0	15				20			0	20	0		5	5			2	5	35
ASPECT	SE		SE				SE	2 S	2 S		S			E	SW			W	W	NE
SOIL																				
MOISTURE REGIME	6	5	5	7	7	6	5	6	8	7	4	9	7	5	5	6	8	8	4	4
DRAINAGE																				
SITE POSITION	3	1	3	6	7	2	3	1	6	6	3	6	6	3	3	6	5	6	2	3
STABILITY INDEX																				
MICROTOPOGRAPHY																				
ROCK																				
HUMUS																				
MINERAL SOIL						3														
DEAD FALL	40	20	60		15	51	20	15			10			15		10			10	10
WATER				30	05	0			30			50	25			10	40	40		
TOTAL UNVEGETATED											10				15					
TREE CANOPY I	30	45	65	0	35	50	50	40	.5	50	50	.5		20	65	40		.5	45	5
TREE CANOPY II														50						10
SHRUB CANOPY I		40							50									80		60
SHRUB CANOPY II	25	03	16	.5	30	10	40	42	.5	40	45	60	10	15	15	50	05	0	40	.1
HERB-DWARF SHRUB	80	50	70	50	80	60	25	30	60	25	40	50	55	35	50	50	22	40	70	70
BRYOID	20	50	40	60	80	85	80	80	05	90	70	15	25	75	70	20	60	50	50	15

LAYER NUMBER 1: TREE CANOPY I — 8 SPECIES — RUN ON TUE JUN 19/84 12:12:08 —

Abies sp.	14	10	--	--	--	25	20	05	.5	--	--	--	--	--	25	10	--	--	10	--
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--
Picea complex	03	05	.5	--	15	25	15	20	.5	--	30	--	--	20	30	30	--	--	--	--
Picea mariana	--	--	--	--	--	--	--	--	--	50	--	.5	--	--	--	--	--	.5	--	--
Pinus contorta	13	30	65	--	20	--	15	15	--	--	20	--	--	--	10	--	--	--	25	--
Populus balsamifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05
Populus tremuloides	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	--
TOTAL	30	45	65	0	35	50	50	40	.5	50	50	.5		20	65	40		.5	45	5

VEGETATION STAND TABLE

NATURAL AREAS PROGRAM--ALBERTA ENERGY AND NATURAL RESOURCES — PART 2 OF 4

THIS TABLE CONTAINS 241 SPECIES IN 72 PLOTS

VEGETATION PLOT NUMBER	CB83 024	CB83 025	CB83 026	CB83 027	CB83 028	CB83 030	CB83 031	CB83 032	CB83 033	CB83 034	CB83 036	CB83 037	CB83 038	CB83 039	CB83 040	CB83 041	CB83 042	CB83 043	CB83 044	MF83 001
PROJECT IDENTIFICATION	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN
LEGAL	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5
BIOGEOGRAPHICAL ZONE																				
IBP CODE																				
VEGETATION TYPE																				
LANDFORM																				
ELEVATION (M)																				
SLOPE (DEGREES)	2		8	3	2	5			20	3			8							02
ASPECT	NE		N	N	SW	E			NW	NE			NE					S	S	SW
SOIL																				
MOISTURE REGIME	5	7	7	8	4	6	8	7	5	6	7	6	5	7	8	7	9	7	3	6
DRAINAGE																				
SITE POSITION	5	6	4	6	3	3	6	6	3	5	6	7	2	6	6	6	6	5	2	2
STABILITY INDEX																				
MICROTOPOGRAPHY																				
ROCK									5											
HUMUS									3											
MINERAL SOIL																00				
DEAD FALL	10		15	05	15	20		5	10	15		10	15		25	00				07
WATER				10			30	5							10					
TOTAL UNVEGETATED																00				
TREE CANOPY I	30	10	20		40	20		15	60	15		20	55	15	30		10	.5		40
TREE CANOPY II	05	10	50		20	1				.5			02		25					
SHRUB CANOPY I	15	30	10	50		5		10	10	03	2	05		05	05	15	05	05		05
SHRUB CANOPY II	20	05	05	25	30	15		35	20	15	20	50	40	20	10	20	23	65		25
HERB-DWARF SHRUB	80	70	75	70	60	70	50	65	65	95	55	50	55	75	70	71	63	45	95	75
BRYOID	20	10	10	10	50	85	90	95	80	10	75	70	70	60	40	80	75	60		35

LAYER NUMBER 1: TREE CANOPY I — 8 SPECIES — RUN ON TUE JUN 19/84 12:12:08 — PART 2 OF 4

Abies sp.	15	--	--	--	--	--	--	--	25	05	--	--	25	--	--	--	--	--	--	15
Betula papyrifera	05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20	--	--	--	--	--
Picea complex	05	--	05	--	--	--	--	--	10	10	--	--	30	--	--	--	--	.5	--	--
Picea mariana	--	--	--	--	--	15	--	15	--	--	--	20	--	15	10	--	10	--	--	--
Pinus contorta	--	--	15	--	40	05	--	--	25	--	--	--	.5	--	--	--	--	--	--	25
Populus balsamifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Populus tremuloides	05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	30	10	20		40	20		15	60	15		20	55	15	30		10	.5		40

VEGETATION STAND TABLE

NATURAL AREAS PROGRAM--ALBERTA ENERGY AND NATURAL RESOURCES

PART 3 OF 4

THIS TABLE CONTAINS 241 SPECIES IN 72 PLOTS

VEGETATION PLOT NUMBER	MF83 002	MF83 004	MF83 005	MF83 006	MF83 007	MF83 008	MF83 009	MF83 010	MF83 011	MF83 012	MF83 013	MF83 015	MF83 016	MF83 017	MF83 018	MF83 020	MF83 021	MF83 023	MF83 024	MF83 025
PROJECT IDENTIFICATION	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN
LEGAL	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5
BIOGEOGRAPHICAL ZONE																				
IBP CODE																				
VEGETATION TYPE																				
LANDFORM																				
ELEVATION (M)																				
SLOPE (DEGREES)	7	9	4	14	11	05	16	7	8	9	11	7	0	05	2	18	2	2	1	0
ASPECT	W	N	W	N	NW	SW	SE	NE	E	SE	NE	NW		SW	N	S	NW	NW	SW	
SOIL																				
MOISTURE REGIME	6	6	5	7	6	5	6	8	6	6	5	5	6	6	7	6	8	5	7	7
DRAINAGE																				
SITE POSITION	2	3	1	4	3	2	4	5	3	3	3	1	7	2	2	3	6	4	2	3
STABILITY INDEX																				
MICROTOPOGRAPHY																				
ROCK																				
HUMUS																		01		
MINERAL SOIL																				
DEAD FALL	01	05	10	5	15	02	15	10	15		15	02	05			05	.5	12		02
WATER								05							01		02			01
TOTAL UNVEGETATED																		13		
TREE CANOPY I		20	30		75	55	35	05	90	30	45	25	50	03	30	25	07	80	03	35
TREE CANOPY II		40	25									25								
SHRUB CANOPY I	60	05	10				05	10		02	15	05	25	80		65			05	03
SHRUB CANOPY II	10	25	15	05		03	25	05		05	60	20	30	00	07	05		05	30	05
HERB-DWARF SHRUB	55	75	90	95	35	75	75	90	70	85	70	50	65	45	85	80	90	80	50	65
BRYOID	.5	35	30	0	85	15	05	05	40	05	35	60	.5	.5	70	.5	50	90	60	90

LAYER NUMBER 1: TREE CANOPY I — 8 SPECIES — RUN ON TUE JUN 19/84 12:12:08 — PART 3 OF 4

Abies sp.	--	08	05	--	73	05	10	--	35	10	.5	--	--	--	--	--	--	70	--	--
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	02	.5	--	.5	--	.5	02	--	10	--	10	--	01	--	--	--	05	--	--
Picea mariana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30	--	07	--	02	34
Pinus contorta	--	10	25	--	02	50	25	03	55	10	45	15	--	01	--	--	--	05	01	01
Populus balsamifera	--	--	--	--	--	--	--	--	--	--	--	--	50	--	--	25	--	--	--	--
Populus tremuloides	--	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	--	--	--	--
TOTAL		20	30		75	55	35	05	90	30	45	25	50	03	30	25	07	80	03	35

VEGETATION STAND TABLE

NATURAL AREAS PROGRAM--ALBERTA ENERGY AND NATURAL RESOURCES

THIS TABLE CONTAINS 241 SPECIES IN 72 PLOTS

VEGETATION PLOT NUMBER	MF83 026	MF83 027	MF83 028	MF83 029	MF83 030	MF83 031	MF83 131	MF83 231	MF83 032	MF83 033	MF83 034	MF83 035
PROJECT IDENTIFICATION	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN	GSEM TN
LEGAL	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5	66 14W5
BIOGEOGRAPHICAL ZONE												
IBP CODE												
VEGETATION TYPE												
LANDFORM												
ELEVATION (M)												
SLOPE (DEGREES)	03											
ASPECT	SW	O	NW	NE					SW	S	N	E
SOIL												
MOISTURE REGIME	5	5	7	6	7	9	8	6	5	6	5	7
DRAINAGE												
SITE POSITION	2	3		3	7	6	6	6	2	5	3	5
STABILITY INDEX			2									
MICROTOPOGRAPHY												
ROCK												
HUMUS												03
MINERAL SOIL												
DEAD FALL	10	10		03	01				07		08	08
WATER					01	05	05					
TOTAL UNVEGETATED			06									
TREE CANOPY I	50	80	20	20	10				65	0	40	75
TREE CANOPY II	03									0		
SHRUB CANOPY I	20		03	05	20				.5	0	10	40
SHRUB CANOPY II	08	04	02	25	35			05	50	0	68	15
HERB-DWARF SHRUB	85	77	85	45	50	60	55	70	75	95	35	95
BRYOID	95	93	95	95	90	99	50	60	90	03	98	.5

LAYER NUMBER 1: TREE CANOPY I — 8 SPECIES — RUN ON TUE JUN 19/84 12:12:08 —

Abies sp.	03	75	--	03	--	--	--	--	04	--	15	--
Betula pspyrifera	--	--	--	--	--	--	--	--	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	07	--	--	--	--	--	--	--	--	--	05	--
Picea mariana	--	--	20	15	10	--	--	--	60	--	--	--
Pinus contorta	40	05	--	02	--	--	--	--	01	--	20	--
Populus balsamifera	--	--	--	--	--	--	--	--	--	--	--	75
Populus tremuloides	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	50	80	20	20	10				65	0	40	75

LAYER NUMBER 2: TREE CANOPY II 6 SPECIES PART 1 OF 4

VEGETATION PLOT NUMBER	CB83 001	CB83 002	CB83 003	CB83 004	CB83 005	CB83 006	CB83 007	CB83 009	CB83 010	CB83 011	CB83 013	CB83 014	CB83 015	CB83 016	CB83 017	CB83 018	CB83 019	CB83 021	CB83 022	CB83 023
Abies sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	50	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus tenuifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
TOTAL														50						10

LAYER NUMBER 2: TREE CANOPY II 6 SPECIES PART 2 OF 4

VEGETATION PLOT NUMBER	CB83 024	CB83 025	CB83 026	CB83 027	CB83 028	CB83 030	CB83 031	CB83 032	CB83 033	CB83 034	CB83 036	CB83 037	CB83 038	CB83 039	CB83 040	CB83 041	CB83 042	CB83 043	CB83 044	MF83 001
Abies sp.	--	--	--	--	10	--	--	--	--	.5	--	--	02	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	25	--	--	--	--	--
Alnus tenuifolia	--	--	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	10	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	05	10	50		20	1				.5			02		25					

LAYER NUMBER 2: TREE CANOPY II 6 SPECIES PART 3 OF 4

VEGETATION PLOT NUMBER	MF83 002	MF83 004	MF83 005	MF83 006	MF83 007	MF83 008	MF83 009	MF83 010	MF83 011	MF83 012	MF83 013	MF83 015	MF83 016	MF83 017	MF83 018	MF83 020	MF83 021	MF83 023	MF83 024	MF83 025
Abies sp.	--	40	20	--	--	--	--	--	--	--	--	25	--	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus tenuifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL		40	25									25								

LAYER NUMBER 2: TREE CANOPY II 6 SPECIES PART 4 OF 4

VEGETATION PLOT NUMBER	MF83 026	MF83 027	MF83 028	MF83 029	MF83 030	MF83 031	MF83 131	MF83 231	MF83 032	MF83 033	MF83 034	MF83 035
Abies sp.	03	--	--	--	--	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--
Alnus tenuifolia	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	03									0		

LAYER NUMBER 3: SHRUB CANOPY I 16 SPECIES PART 1 OF 4

VEGETATION PLOT NUMBER	CB83 001	CB83 002	CB83 003	CB83 004	CB83 005	CB83 006	CB83 007	CB83 009	CB83 010	CB83 011	CB83 013	CB83 014	CB83 015	CB83 016	CB83 017	CB83 018	CB83 019	CB83 021	CB83 022	CB83 023
Abies sp.	--	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus crispa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus tenuifolia	--	--	--	--	--	--	--	--	50	--	--	--	--	--	--	--	--	80	--	--
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea engelmannii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10
Salix scouleriana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL		40							50									80		60

LAYER NUMBER 3: SHRUB CANOPY I 16 SPECIES PART 2 OF 4

VEGETATION PLOT NUMBER	CB83 024	CB83 025	CB83 026	CB83 027	CB83 028	CB83 030	CB83 031	CB83 032	CB83 033	CB83 034	CB83 036	CB83 037	CB83 038	CB83 039	CB83 040	CB83 041	CB83 042	CB83 043	CB83 044	MF83 001
Abies sp.	--	--	--	--	--	--	--	--	10	.1	--	--	--	--	01	--	--	--	--	05
Alnus crispa	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus tenuifolia	05	25	10	40	--	--	--	--	--	03	--	--	--	--	--	--	--	--	--	--
Betula papyrifera	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--
Picea engelmannii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	--	--	--	15	--	10	--	--	02	05	--	05	01	15	05	--	--	--
Picea sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	10	05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--	--	--	--	--
Salix scouleriana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix sp.	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	15	30	10	50		5		10	10	03	2	05		05	05	15	05	05		05

LAYER NUMBER 3: SHRUB CANOPY I 16 SPECIES PART 3 OF 4

VEGETATION PLOT NUMBER	MF83 002	MF83 004	MF83 005	MF83 006	MF83 007	MF83 008	MF83 009	MF83 010	MF83 011	MF83 012	MF83 013	MF83 015	MF83 016	MF83 017	MF83 018	MF83 020	MF83 021	MF83 023	MF83 024	MF83 025
Abies sp.	.5	05	10	--	--	--	05	--	--	02	15	05	--	--	--	--	--	--	--	--
Alnus crispa	60	--	--	--	--	--	--	10	--	--	.5	--	--	80	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	60	--	--	--	--
Alnus tenuifolia	--	--	--	--	--	--	--	--	--	--	--	--	20	--	--	--	--	--	--	--
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea engelmannii	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	03
Picea sp.	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix scouleriana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--
Salix sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	60	05	10				05	10		02	15	05	25	80		65			05	03

LAYER NUMBER 3: SHRUB CANOPY I 16 SPECIES PART 4 OF 4

VEGETATION PLOT NUMBER	MF83 026	MF83 027	MF83 028	MF83 029	MF83 030	MF83 031	MF83 131	MF83 231	MF83 032	MF83 033	MF83 034	MF83 035
Abies sp.	20	--	--	--	--	--	--	--	.5	--	10	--
Alnus crispa	--	--	--	--	--	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	40
Alnus tenuifolia	--	--	--	--	--	--	--	--	--	--	--	--
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--
Picea engelmannii	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	03	05	20	--	--	--	--	--	--	--
Picea sp.	--	--	--	--	--	--	--	--	--	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--
Salix scouleriana	--	--	--	--	--	--	--	--	--	--	--	--
Salix sp.	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	20		03	05	20				.5	0	10	40

LAYER NUMBER 4: SHRUB CANOPY II 31 SPECIES PART 1 OF 4

VEGETATION PLOT NUMBER	CB83 001	CB83 002	CB83 003	CB83 004	CB83 005	CB83 006	CB83 007	CB83 009	CB83 010	CB83 011	CB83 013	CB83 014	CB83 015	CB83 016	CB83 017	CB83 018	CB83 019	CB83 021	CB83 022	CB83 023
Abies sp.	14	--	10	--	--	05	40	05	--	--	02	--	--	05	05	.5	--	--	25	--
Alnus crispa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus tenuifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Betula glandulosa	--	02	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--
Betula pumila	--	--	--	.5	20	--	--	--	--	05	--	10	10	--	--	--	05	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--
Ledum groenlandicum	--	--	--	--	10	05	--	30	--	35	15	--	--	10	10	--	--	--	--	--
Lonicera involucrata	.5	--	--	--	--	--	--	--	.5	--	--	.1	--	--	--	15	--	--	--	--
Oplopanax horridum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	.5	--	05	--	--	--	.5	--	--	--	25	--	--	--	--	.1	--	--	.5	--
Picea glauca	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	--	.5	--	--	--	--	--	.5	--	.5	--	--	--	--	.5	--	--	--
Picea sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinus contorta	--	--	--	.5	--	--	--	--	--	--	03	--	--	--	--	--	--	--	--	--
Rhododendron albiflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes americanum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--
Ribes glandulosum	.5	--	--	--	--	--	--	--	.1	--	--	--	--	--	--	--	--	--	--	--
Ribes lacustre	10	--	.5	--	--	--	--	--	.5	--	--	--	--	--	--	.5	--	--	--	.1
Ribes laxiflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rosa acicularis	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	.5	--	--	--	--
Salix bebbiana	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix drummondiana	--	--	--	--	--	--	--	--	--	--	--	10	--	--	--	--	--	--	--	--
Salix mackenzieana	--	--	--	--	--	--	--	--	--	--	.5	40	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Salix pyrifolia	--	--	.5	--	--	--	--	--	--	.5	--	--	--	--	--	15	--	--	--	--
Salix scouleriana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15	--	--	--	--
Sambucus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sorbus sp.	--	01	.5	--	--	--	--	02	--	--	--	--	--	--	--	--	--	--	--	--
Viburnum edule	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	.1
TOTAL	25	03	16	.5	30	10	40	42	.5	40	45	60	10	15	15	50	05	0	40	.1

LAYER NUMBER 4: SHRUB CANOPY II 31 SPECIES PART 2 OF 4

VEGETATION PLOT NUMBER	CB83 024	CB83 025	CB83 026	CB83 027	CB83 028	CB83 030	CB83 031	CB83 032	CB83 033	CB83 034	CB83 036	CB83 037	CB83 038	CB83 039	CB83 040	CB83 041	CB83 042	CB83 043	CB83 044	MF83 001
Abies sp.	10	--	--	--	05	--	--	--	15	--	--	--	05	--	--	--	--	--	--	16
Alnus crispa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus tenuifolia	--	--	--	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Betula glandulosa	--	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	03	05	--	--
Betula pumila	--	--	--	--	05	--	--	15	--	--	15	15	--	05	05	15	--	--	--	01
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ledum groenlandicum	--	--	--	--	20	--	--	15	--	--	.5	35	35	10	--	05	05	--	--	--
Lonicera involucrata	05	05	03	05	--	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--
Oplopanax horridum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea glauca	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	--	--	--	--	--	05	--	--	05	--	--	05	03	--	15	--	--	--
Picea sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rhododendron [illegible]iflorum	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--	02
Ribes americanum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes glandulosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes lacustre	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--
Ribes laxiflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01
Rosa acicularis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix drummondiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix mackenzieana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30	--	--
Salix pyrifolia	--	--	--	--	--	05	--	--	--	--	--	--	--	--	02	--	--	--	--	--
Salix scouleriana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sambucus sp.	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	02
Sorbus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03
Viburnum edule	--	--	05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	20	05	05	25	30	15		35	20	15	20	50	40	20	10	20	23	65		25

LAYER NUMBER 4: SHRUB CANOPY II 31 SPECIES PART 3 OF 4

VEGETATION PLOT NUMBER	MF83 002	MF83 004	MF83 005	MF83 006	MF83 007	MF83 008	MF83 009	MF83 010	MF83 011	MF83 012	MF83 013	MF83 015	MF83 016	MF83 017	MF83 018	MF83 020	MF83 021	MF83 023	MF83 024	MF83 025
Abies sp.	01	--	14	--	--	03	25	--	--	03	60	15	05	--	--	--	--	05	--	--
Alnus crispa	07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	--	20	--	--	03	--	--	--	--
Alnus tenuifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Betula glandulosa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20	--
Betula pumila	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ledum groenlandicum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05	--
Lonicera involucrata	01	--	--	05	--	--	--	05	--	--	--	05	03	--	--	--	--	--	--	--
Oplopanax horridum	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea glauca	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	07	--	--	--	02	05
Picea sp.	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	--	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--
Rhododendron albiflorum	--	--	01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes americanum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes glandulosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes lacustre	01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes laxiflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rosa acicularis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix drummondiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix mackenzieana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix scouleriana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	--
Salix sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sambucus sp.	.5	--	--	--	--	--	--	--	--	02	.5	--	--	--	--	--	--	--	--	--
Sorbus sp.	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Viburnum edule	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	10	25	15	05		03	25	05		05	60	20	30	00	07	05		05	30	05

LAYER NUMBER 4: SHRUB CANOPY II 31 SPECIES PART 4 OF 4

VEGETATION PLOT NUMBER	MF83 026	MF83 027	MF83 028	MF83 029	MF83 030	MF83 031	MF83 131	MF83 231	MF83 032	MF83 033	MF83 034	MF83 035
Abies sp.	08	04	--	--	--	--	--	--	--	--	03	--
Alnus crispa	--	--	--	--	--	--	--	--	--	--	--	--
Alnus sp.	--	--	--	--	--	--	--	--	--	--	--	10
Alnus tenuifolia	--	--	--	--	--	--	--	--	--	--	--	--
Betula glandulosa	--	--	--	--	--	--	--	--	--	--	--	--
Betula pumila	--	--	--	01	05	--	--	.5	--	--	--	--
Larix laricina	--	--	--	--	--	--	--	--	--	--	--	--
Ledum groenlandicum	--	--	--	19	25	--	--	--	50	--	--	--
Lonicera involucrata	--	--	--	--	--	--	--	--	--	--	--	05
Oplopanax horridum	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--
Picea glauca	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	02	05	05	--	--	--	--	--	--	--
Picea sp.	--	--	--	--	--	--	--	--	--	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--
Rhododendron albiflorum	--	--	--	--	--	--	--	--	--	--	65	--
Ribes americanum	--	--	--	--	--	--	--	--	--	--	--	--
Ribes glandulosum	--	--	--	--	--	--	--	--	--	--	--	--
Ribes lacustre	--	--	--	--	--	--	--	--	--	--	--	--
Ribes laxiflorum	--	--	--	--	--	--	--	--	--	--	--	--
Rosa acicularis	--	--	--	--	--	--	--	--	--	--	--	--
Salix bebbiana	--	--	--	--	--	--	--	--	--	--	--	--
Salix drummondiana	--	--	--	--	--	--	--	--	--	--	--	--
Salix mackenzieana	--	--	--	--	--	--	--	--	--	--	--	--
Salix planifolia	--	--	--	--	--	--	--	--	--	--	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--
Salix scouleriana	--	--	--	--	--	--	--	--	--	--	--	--
Salix sp.	--	--	--	--	--	--	--	--	--	--	--	--
Sambucus sp.	--	--	--	--	--	--	--	--	--	--	--	--
Sorbus sp.	--	--	--	--	--	--	--	--	--	--	.5	--
Viburnum edule	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	08	04	02	25	35			05	50	0	68	15

LAYER NUMBER 5: HERB-DWARF SHRUB 158 SPECIES PART 1 OF 4

VEGETATION PLOT NUMBER	CB83 001	CB83 002	CB83 003	CB83 004	CB83 005	CB83 006	CB83 007	CB83 009	CB83 010	CB83 011	CB83 013	CB83 014	CB83 015	CB83 016	CB83 017	CB83 018	CB83 019	CB83 021	CB83 022	CB83 023
Abies sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	02	.5	--	--	--	02	--
Achillea millefolium	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	.5	--	--	--	--
Actaea rubra	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Agropyron trachycaulum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Agrostis scabra	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Andromeda polifolia	--	--	--	01	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--
Antennaria neglecta	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Antennaria nitida	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Arctostaphylos uva-ursi	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Arenaria lateriflora	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arnica chamissonis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arnica cordifolia	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
Aster ciliolatus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aster modestus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Athyrium filix-femina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Betula glandulosa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromus ciliatus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Calamagrostis canadensis	35	.1	10	--	05	10	--	--	55	--	--	25	.5	--	--	20	--	23	10	05
Carex aquatilis	--	--	--	--	--	--	--	--	--	--	--	20	--	--	--	--	--	--	--	--
Carex brevior	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex brunnescens	--	--	--	--	10	--	--	--	--	--	--	05	--	--	--	--	--	10	--	--
Carex canescens	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--
Carex disperma	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--
Carex interior	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex limosa	--	--	--	06	--	--	--	--	--	--	--	--	10	--	--	--	--	--	--	--
Carex media	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	--
Carex pachystachya	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex pauciflora	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex paupercula	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	05	--	--	--
Carex petasata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex praticola	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex retrorsa	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--
Carex rostrata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex tenuiflora	--	--	--	--	--	--	--	--	--	--	--	--	10	--	--	--	--	--	--	--
Carex trisperma	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysoplenium iowense	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cinna latifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Circaea alpina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cirsium foliosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Coptis trifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--
Cornus canadensis	03	10	20	--	--	--	04	05	--	02	05	--	--	10	12	02	--	--	07	--
Cystopteris fragilis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Delphinium glaucum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05
Drosera anglica	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dryopteris spinulosa	03	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
Empetrum nigrum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Epilobium angustifolium	15	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	03	.5
Epilobium glandulosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Epilobium palustre	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--
Equisetum arvense	.1	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	05
Equisetum fluviatile	--	--	--	12	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--

Equisetum pratense	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--	--	--	02
Equisetum scirpoides	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Equisetum sylvaticum	02	--	01	--	60	20	.5	--	--	05	.5	--	--	--	--	08	--	05	--	--
Equisetum variegatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum angustifolium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum brachyantherum	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--
Eriophorum chamissonis	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum vaginatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fragaria virginiana	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Galium boreale	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Galium triflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
Gaultheria hispidula	--	--	--	--	--	--	--	01	--	02	--	--	--	--	--	--	--	--	--	--
Geocaulon lividum	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Geranium nervosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Geranium richardsonii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Geum macrophyllum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Geum rivale	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--	--	--	--
Glyceria borealis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gymnocarpium dryopteris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05
Heracleum lanatum	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	40
Hieracium gracile	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Impatiens sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juncus albescens	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juncus stygius	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Kalmia polifolia	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lathyrus ochroleucus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ledum groenlandicum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Linnaea borealis	--	04	02	--	--	--	01	--	--	--	03	--	--	05	--	.5	--	--	05	--
Listera borealis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Listera cordata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Luzula parviflora	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	.5	--	--	--	--
Lycopodium annotinum	03	01	--	--	--	--	04	--	--	--	--	--	--	.5	03	--	--	--	--	--
Lycopodium complanatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--
Maianthemum canadense	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Menyanthes trifoliata	--	--	--	25	--	--	--	--	--	--	--	--	10	--	--	--	10	--	--	--
Mertensia paniculata	.5	--	--	--	--	--	--	--	02	--	--	--	--	--	--	.5	--	--	--	.5
Mitella nuda	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	03
Moneses uniflora	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	.5	--	--	--	--
Oryzopsis asperifolia	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--
Osmorhiza depauperata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Osmorhiza sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oxycoccus microcarpus	--	--	--	.5	.5	--	--	--	--	--	--	--	.5	--	--	--	.5	--	--	--
Parnassia palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--
Pedicularis groenlandica	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis labradorica	--	--	--	--	--	--	--	--	--	--	02	--	--	--	--	--	--	--	--	--
Pedicularis sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Penstemon procerus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Petasites palmatus	.5	--	.5	--	--	--	--	--	--	--	01	--	--	--	--	--	--	--	02	--
Phleum alpinum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Picea mariana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Poa pratensis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Potentilla palustris	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	01	--	--
Pyrola asarifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrola minor	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--
Pyrola secunda	--	.5	.5	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--
Ranunculus lapponicus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes glandulosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Ribes lacustre	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes laxiflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rosa acicularis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rubus acaulis	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	.5	--	--	--	--
Rubus chamaemorus	--	--	--	--	05	.1	--	--	--	10	--	.5	--	--	--	--	--	--	--	--
Rubus pedatus	15	15	02	--	--	30	15	10	--	--	--	--	--	15	10	--	--	--	--	--
Rubus pubescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
Rubus strigosus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rumex occidentalis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rumex sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix pedicellaris	--	--	--	.5	--	--	--	--	--	--	--	--	20	--	--	--	--	--	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sambucus sp.	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Scheuchzeria palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Schizachne purpurascens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Senecio triangularis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Smilacina racemosa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Smilacina stellata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Smilacina trifolia	--	--	--	01	--	--	--	--	--	.5	--	.5	--	--	--	--	.5	--	--	--
Solidago gigantea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sorbus sitchensis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sorbus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sparganium hyperboreum	--	--	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Spiranthes romanzoffiana	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria calycantha	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria crispa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria longifolia	--	--	--	--	--	--	--	--	--	--	--	.1	--	--	--	--	--	--	--	--
Streptopus amplexifolius	03	.5	.5	--	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thalictrum occidentale	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thalictrum sparsiflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thalictrum venulosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tiarella trifoliata	01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trientalis borealis	--	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trisetum spicatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Urtica gracilis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05
Vaccinium caespitosum	--	--	--	--	--	--	.5	10	--	--	--	--	--	--	--	--	--	--	--	--
Vaccinium membranaceum	--	20	.1	--	--	.1	01	--	--	01	--	--	--	.5	05	--	--	--	--	--
Vaccinium myrtilloides	--	.5	35	--	--	--	--	01	--	05	20	--	--	--	15	--	--	--	50	--
Vaccinium vitis-idaea	--	--	--	--	.5	--	--	03	--	02	02	--	--	03	05	--	--	--	--	--
Veronica americana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viburnum edule	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vicia americana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viola palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--
Viola renifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viola sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	80	50	70	50	80	60	25	30	60	25	40	50	55	35	50	50	22	40	70	70

LAYER NUMBER 5: HERB-DWARF SHRUB 158 SPECIES PART 2 OF 4

VEGETATION PLOT NUMBER	CB83 024	CB83 025	CB83 026	CB83 027	CB83 028	CB83 030	CB83 031	CB83 032	CB83 033	CB83 034	CB83 036	CB83 037	CB83 038	CB83 039	CB83 040	CB83 041	CB83 042	CB83 043	CB83 044	MF83 001
Abies sp.	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Achillea millefolium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	.5	--
Actaea rubra	.5	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--
Agropyron trachycaulum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Agrostis scabra	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Andromeda polifolia	--	--	--	--	--	--	05	05	--	--	--	--	--	.5	--	03	10	--	--	--
Antennaria neglecta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Antennaria nitida	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arctostaphylos uva-ursi	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arenaria lateriflora	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arnica chamissonis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Arnica cordifolia	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aster ciliolatus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	03	--
Aster modestus	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	.5	02	--
Athyrium filix-femina	--	30	03	.5	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--
Betula glandulosa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromus ciliatus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.1	15	--
Calamagrostis canadensis	50	15	40	40	--	30	--	--	05	35	--	--	--	--	46	--	--	25	23	05
Carex aquatilis	--	--	--	--	--	--	--	--	--	--	--	--	--	04	--	35	--	05	--	--
Carex brevior	--	--	--	--	--	--	--	--	--	--	--	.1	--	--	--	--	--	--	--	--
Carex brunnescens	--	--	--	--	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex canescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	--	--
Carex disperma	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	--	--
Carex interior	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	--	--
Carex limosa	--	--	--	--	--	--	25	03	--	--	--	--	--	--	--	10	--	--	--	--
Carex media	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex pachystachya	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Carex pauciflora	--	--	--	--	--	--	--	15	--	--	.5	--	--	50	--	05	03	--	--	--
Carex paupercula	--	--	--	--	--	--	--	--	--	--	02	--	--	--	.5	--	--	--	--	--
Carex petasata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15	--
Carex praticola	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex retrorsa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex rostrata	--	--	--	--	--	--	--	--	--	--	50	--	--	--	--	--	--	--	--	--
Carex sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex tenuiflora	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex trisperma	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysoplenium iowense	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cinna latifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Circaea alpina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cirsium foliosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Coptis trifolia	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Cornus canadensis	10	--	--	--	10	.1	--	--	10	.5	--	--	--	--	--	--	--	--	--	12
Cystopteris fragilis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
Delphinium glaucum	--	.5	04	05	--	--	--	--	--	.5	--	--	--	--	--	--	--	.5	02	--
Drosera anglica	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dryopteris spinulosa	--	--	--	--	--	.1	--	--	10	03	--	--	--	--	--	--	--	--	--	02
Empetrum nigrum	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--
Epilobium angustifolium	05	--	--	--	--	.1	--	--	.5	.5	--	--	--	--	--	--	--	03	10	01
Epilobium glandulosum	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Epilobium palustre	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--
Equisetum arvense	.5	--	--	--	--	--	--	--	--	02	--	--	--	--	01	--	--	--	--	--
Equisetum fluviatile	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--

Equisetum pratense	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Equisetum scirpoides	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--
Equisetum sylvaticum	--	--	.5	05	--	25	--	--	.5	.5	--	01	--	--	--	--	--	.5	--	--
Equisetum variegatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum angustifolium	--	--	--	--	--	--	15	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum brachyantherum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum chamissonis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	05	--	--	--
Eriophorum vaginatum	--	--	--	--	--	--	--	--	--	--	03	--	--	02	--	--	--	--	--	--
Fragaria virginiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	02	--	--
Galium boreale	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Galium triflorum	.1	.5	.5	--	--	--	--	--	--	02	--	--	--	--	--	--	--	--	--	--
Gaultheria hispidula	--	--	--	--	--	--	--	--	--	--	--	03	--	--	--	--	--	--	--	--
Geocaulon lividum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Geranium nervosum	--	--	--	--	--	--	--	--	--	.1	--	--	--	--	--	--	--	--	--	--
Geranium richardsonii	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Geum macrophyllum	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	01	02	--
Geum rivale	--	--	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Glyceria borealis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Gymnocarpium dryopteris	--	.5	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Heracleum lanatum	--	20	--	15	--	--	--	--	--	15	--	--	--	--	--	--	--	--	--	--
Hieracium gracile	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Impatiens sp.	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juncus albescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juncus stygius	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Kalmia polifolia	--	--	--	--	--	.	--	05	--	--	--	05	--	04	--	02	--	--	--	--
Lathyrus ochroleucus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ledum groenlandicum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Linnaea borealis	03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Listera borealis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05
Listera cordata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Luzula parviflora	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	.5	--	.5
Lycopodium annotinum	.5	--	--	--	.5	--	--	--	05	--	--	--	--	--	--	--	--	--	--	04
Lycopodium complanatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maianthemum canadense	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Menyanthes trifoliata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Mertensia paniculata	03	.5	.5	01	--	--	--	--	--	10	--	--	--	--	--	--	--	.5	--	--
Mitella nuda	--	.5	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	01	--	--
Moneses uniflora	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Oryzopsis asperifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Osmorhiza depauperata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Osmorhiza sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oxycoccus microcarpus	--	--	--	--	--	--	.5	.5	--	--	--	.5	--	.5	--	--	--	--	--	--
Parnassia palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis groenlandica	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis labradorica	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Penstemon procerus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Petasites palmatus	02	--	--	--	.5	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Phleum alpinum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Picea complex	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	.5	.5	--	--	--
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Poa pratensis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Potentilla palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	08	--	--	02	--	--
Pyrola asarifolia	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrola minor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--
Pyrola secunda	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	01
Ranunculus lapponicus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	--	--	--
Ribes glandulosum	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--

Ribes lacustre	.5	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--
Ribes laxiflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rosa acicularis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rubus acaulis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--	--	--	--	--
Rubus chamaemorus	--	--	--	--	--	05	--	35	--	--	--	40	--	15	03	01	15	.5	--	--
Rubus pedatus	03	--	--	--	05	05	--	--	30	--	--	--	--	--	--	--	--	--	--	25
Rubus pubescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rubus strigosus	.5	--	03	03	--	--	--	--	--	20	--	--	--	--	--	--	--	--	--	--
Rumex occidentalis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Rumex sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix pedicellaris	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sambucus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Scheuchzeria palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Schizachne purpurascens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15	--
Senecio triangularis	--	.5	05	02	--	--	--	--	--	03	--	--	--	--	.5	--	--	.5	--	--
Smilacina racemosa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Smilacina stellata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Smilacina trifolia	--	--	--	--	--	--	05	02	--	--	.5	--	--	.5	.5	05	10	--	--	--
Solidago gigantea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	03	--
Sorbus sitchensis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sorbus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sparganium hyperboreum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Spiranthes romanzoffiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria calycantha	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	.5
Stellaria crispa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria longifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Streptopus amplexifolius	.5	--	--	--	.5	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	03
Thalictrum occidentale	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thalictrum sparsiflorum	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thalictrum venulosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05	--
Tiarella trifoliata	--	--	--	--	--	--	--	--	03	--	--	--	--	--	--	--	--	--	--	.5
Trientalis borealis	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--
Trisetum spicatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Urtica gracilis	--	05	02	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--
Vaccinium caespitosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vaccinium membranaceum	--	--	--	--	27	--	--	--	02	--	--	.5	--	--	--	--	--	--	--	17
Vaccinium myrtilloides	04	--	--	--	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
Vaccinium vitis-idaea	--	--	--	--	03	--	--	--	--	--	--	01	--	--	.5	--	--	--	--	--
Veronica americana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viburnum edule	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vicia americana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viola palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	--	--	--
Viola renifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viola sp.	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	80	70	75	70	60	70	50	65	65	95	55	50	55	75	70	71	63	45	95	75

LAYER NUMBER 5: HERB-DWARF SHRUB 158 SPECIES PART 3 OF 4

VEGETATION PLOT NUMBER	MF83 002	MF83 004	MF83 005	MF83 006	MF83 007	MF83 008	MF83 009	MF83 010	MF83 011	MF83 012	MF83 013	MF83 015	MF83 016	MF83 017	MF83 018	MF83 020	MF83 021	MF83 023	MF83 024	MF83 025
Abies sp.	--	03	01	--	06	.5	01	--	01	02	--	--	04	--	--	--	--	05	--	--
Achillea millefolium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Actaea rubra	--	--	--	--	--	.5	09	--	--	02	--	01	03	--	--	--	--	--	--	--
Agropyron trachycaulum	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	--	--	--	--	--
Agrostis scabra	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Andromeda polifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--
Antennaria neglecta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Antennaria nitida	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arctostaphylos uva-ursi	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arenaria lateriflora	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--
Arnica chamissonis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arnica cordifolia	--	--	.5	--	--	01	01	--	--	01	08	02	--	--	--	01	--	--	--	--
Aster ciliolatus	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	03	--	--	--	--
Aster modestus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.1	--	--	--
Athyrium filix-femina	02	--	--	17	--	--	--	04	--	--	--	--	--	--	--	--	--	--	--	--
Betula glandulosa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	05
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Bromus ciliatus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Calamagrostis canadensis	26	--	02	30	--	31	15	20	--	17	08	03	03	34	--	22	10	--	--	--
Carex aquatilis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex brevior	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex brunnescens	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	01	--	--	--
Carex canescens	13	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	01	--	--	--
Carex disperma	--	--	--	--	--	--	--	03	--	--	--	--	--	--	.5	--	--	--	.5	10
Carex interior	--	--	--	--	--	--	--	03	--	--	--	--	--	--	--	--	--	--	--	--
Carex limosa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex media	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex pachystachya	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Carex pauciflora	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36	--
Carex paupercula	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01	--	.5	--
Carex petasata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex praticola	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex retrorsa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex rostrata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex tenuiflora	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carex trisperma	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	25	--	--	--
Chrysoplenium iowense	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Cinna latifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Circaea alpina	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--
Cirsium foliosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Coptis trifolia	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--
Cornus canadensis	.5	10	08	--	05	10	04	--	11	02	03	07	--	01	.5	--	--	15	--	--
Cystopteris fragilis	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Delphinium glaucum	--	--	--	07	--	--	--	06	--	--	--	--	08	--	--	02	--	--	--	--
Drosera anglica	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dryopteris spinulosa	02	.5	01	--	--	--	02	--	01	03	01	--	--	--	--	--	--	02	--	--
Empetrum nigrum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--
Epilobium angustifolium	03	.5	01	--	--	02	03	--	--	03	01	01	02	02	--	13	--	--	--	--
Epilobium glandulosum	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Epilobium palustre	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Equisetum arvense	--	--	--	--	--	--	--	01	--	--	--	--	05	--	--	--	--	--	--	--
Equisetum fluviatile	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Equisetum pratense	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Equisetum scirpoides	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Equisetum sylvaticum	.5	--	--	01	--	--	05	--	5	05	--	--	--	.5	50	--	08	--	--	--
Equisetum variegatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum angustifolium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum brachyantherum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum chamissonis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	--
Eriophorum sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--
Eriophorum vaginatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fragaria virginiana	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	01	--	--	--	--
Galium boreale	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Galium triflorum	--	--	--	02	--	--	--	.5	--	--	--	--	01	--	--	02	--	--	--	--
Gaultheria hispidula	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	.5	--	--	02
Geocaulon lividum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Geranium nervosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Geranium richardsonii	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--
Geum macrophyllum	--	--	--	02	--	--	--	02	--	--	--	--	--	--	--	--	--	--	--	--
Geum rivale	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Glyceria borealis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gymnocarpium dryopteris	01	.5	02	.5	--	--	01	02	--	07	23	04	--	--	--	--	--	15	--	--
Heracleum lanatum	01	--	--	17	--	--	04	16	--	05	--	--	10	.5	--	02	--	--	--	--
Hieracium gracile	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Impatiens sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juncus albescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juncus stygius	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Kalmia polifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	02	.5
Lathyrus ochroleucus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ledum groenlandicum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14	--	05	--	--	08
Linnaea borealis	--	02	02	--	--	06	01	--	.5	02	02	08	--	--	.5	--	--	02	--	--
Listera borealis	--	--	--	--	03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Listera cordata	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--
Luzula parviflora	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	.1	--	--	--
Lycopodium annotinum	--	02	18	--	--	09	02	--	05	01	07	02	--	--	--	--	01	10	--	--
Lycopodium complanatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maianthemum canadense	--	--	.5	--	--	01	--	--	--	.5	--	02	--	--	--	--	--	--	--	--
Menyanthes trifoliata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mertensia paniculata	01	--	--	04	--	01	--	03	--	02	--	--	03	--	--	06	--	--	--	--
Mitella nuda	--	--	--	.5	--	--	--	.5	--	--	--	--	03	--	--	--	--	--	--	--
Moneses uniflora	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oryzopsis asperifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Osmorhiza depauperata	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	--	--	--	--	--
Osmorhiza sp.	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--
Oxycoccus microcarpus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	.5	--	.5	--
Parnassia palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis groenlandica	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis labradorica	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Penstemon procerus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Petasites palmatus	.5	--	01	--	--	.5	--	--	--	01	.5	02	01	.5	--	02	--	.5	--	--
Phleum alpinum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea complex	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--	04	--	--	03
Pinus contorta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Poa pratensis	--	--	--	--	--	--	--	02	--	--	--	--	01	--	--	--	--	--	--	--
Potentilla palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrola asarifolia	--	--	--	--	--	01	--	--	--	.5	--	--	--	--	--	.5	--	--	--	--
Pyrola minor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrola secunda	--	.5	.5	--	--	--	--	--	02	--	.5	--	--	--	--	--	--	01	--	--
Ranunculus lapponicus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ribes glandulosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Ribes lacustre	--	--	.5	--	--	.5	--	--	--	01	.5	--	01	--	--	--	--	--	--	--
Ribes laxiflorum	01	--	--	05	--	--	04	03	--	--	--	--	--	--	--	--	--	--	--	--
Rosa acicularis	01	--	--	--	--	01	.5	.5	--	01	--	--	--	--	--	03	--	--	--	--
Rubus acaulis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rubus chamaemorus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	--	02	--	04	33
Rubus pedatus	.5	50	24	--	15	03	02	--	42	02	03	06	--	--	--	--	--	20	--	01
Rubus pubescens	01	.5	--	02	--	.5	--	--	--	02	--	01	02	--	--	--	--	--	--	--
Rubus strigosus	01	--	--	01	--	--	05	08	--	07	--	--	04	03	--	08	--	--	--	--
Rumex occidentalis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rumex sp.	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Salix pedicellaris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	25	--	--	--
Sambucus sp.	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Scheuchzeria palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Schizachne purpurascens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12	--	--	--	--
Senecio triangularis	--	--	--	04	--	--	--	--	--	--	--	--	01	--	--	.5	02	--	--	--
Smilacina racemosa	--	--	--	--	--	--	01	--	--	03	--	--	--	--	--	--	--	--	--	--
Smilacina stellata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Smilacina trifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	01	--	03	02
Solidago gigantea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sorbus sitchensis	--	.5	01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sorbus sp.	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--
Sparganium hyperboreum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Spiranthes romanzoffiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.1	--	--	--
Stellaria calycantha	01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria crispa	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria longifolia	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Streptopus amplexifolius	--	03	02	02	.5	01	02	--	01	07	05	.5	--	--	--	--	--	01	--	--
Thalictrum occidentale	--	--	--	--	--	.5	03	--	--	02	--	--	--	--	--	--	--	--	--	--
Thalictrum sparsiflorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thalictrum venulosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tiarella trifoliata	--	--	03	--	01	--	04	--	05	03	02	03	--	--	--	--	--	05	--	--
Trientalis borealis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trisetum spicatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Urtica gracilis	.5	--	--	01	--	--	--	04	--	01	--	--	01	--	--	--	--	--	--	--
Vaccinium caespitosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vaccinium membranaceum	--	05	24	--	--	03	--	--	02	--	02	--	--	--	.5	--	--	02	--	.5
Vaccinium myrtilloides	--	--	--	--	--	02	--	--	--	--	--	--	--	03	05	--	02	--	--	--
Vaccinium vitis-idaea	--	--	--	--	--	.5	--	--	.5	--	--	--	--	--	01	--	.5	--	--	01
Veronica americana	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Viburnum edule	01	--	--	--	--	03	06	--	--	03	--	08	04	--	--	08	--	--	--	--
Vicia americana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viola palustris	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viola renifolia	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Viola sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	55	75	90	95	35	75	75	90	70	85	70	50	65	45	85	80	90	80	50	65

LAYER NUMBER 5: HERB-DWARF SHRUB 158 SPECIES PART 4 OF 4

VEGETATION PLOT NUMBER	MF83 026	MF83 027	MF83 028	MF83 029	MF83 030	MF83 031	MF83 131	MF83 231	MF83 032	MF83 033	MF83 034	MF83 035
Abies sp.	02	07	--	.1	--	--	--	--	.5	--	01	--
Achillea millefolium	--	--	--	--	--	--	--	--	--	04	--	--
Actaea rubra	--	--	--	--	--	--	--	--	--	--	--	--
Agropyron trachycaulum	--	--	--	--	--	--	--	--	--	.5	--	--
Agrostis scabra	--	--	--	--	--	--	--	--	--	03	--	--
Andromeda polifolia	--	--	--	--	.5	--	--	.5	--	--	--	--
Antennaria neglecta	--	--	--	--	--	--	--	--	--	--	--	--
Antennaria nitida	--	--	--	--	--	--	--	--	--	--	--	--
Arctostaphylos uva-ursi	--	--	--	--	--	--	--	--	--	--	--	--
Arenaria lateriflora	--	--	--	--	--	--	--	--	--	--	--	--
Arnica chamissonis	--	--	--	--	--	--	--	--	--	.5	--	--
Arnica cordifolia	--	--	--	.5	--	--	--	--	--	--	--	02
Aster ciliolatus	--	--	--	--	--	--	--	--	--	--	--	--
Aster modestus	--	--	--	--	--	--	--	--	--	03	--	--
Athyrium filix-femina	--	--	--	--	--	--	--	--	--	--	--	--
Betula glandulosa	--	--	04	--	--	--	--	--	--	--	--	--
Betula papyrifera	--	--	--	--	--	--	--	--	--	--	--	--
Bromus ciliatus	--	--	--	--	--	--	--	--	--	38	--	--
Calamagrostis canadensis	.5	--	--	--	--	--	--	--	--	10	.5	04
Carex aquatilis	--	--	--	--	--	--	--	60	--	.5	--	--
Carex brevior	--	--	--	--	--	--	--	--	--	--	--	--
Carex brunnescens	--	--	--	--	--	--	--	--	--	--	--	--
Carex canescens	--	--	--	--	--	--	--	--	--	--	--	--
Carex disperma	--	--	--	--	--	--	--	--	--	.5	.5	--
Carex interior	--	--	--	--	--	--	--	--	--	--	--	--
Carex limosa	--	--	--	--	--	10	45	--	--	--	--	--
Carex media	--	--	--	--	--	--	--	--	--	--	--	--
Carex pachystachya	--	--	--	--	--	--	--	--	--	.5	--	--
Carex pauciflora	--	--	--	--	35	--	--	.5	--	--	--	--
Carex paupercula	--	--	--	--	--	--	--	.5	--	--	--	--
Carex petasata	--	--	--	--	--	--	--	--	--	--	--	--
Carex praticola	--	--	--	--	--	--	--	--	--	02	--	--
Carex retrorsa	--	--	--	--	--	--	--	--	--	--	--	--
Carex rostrata	--	--	--	--	--	--	--	--	--	.5	--	--
Carex sp.	--	--	--	--	--	--	--	02	--	--	--	--
Carex tenuiflora	--	--	--	--	--	--	--	--	--	--	--	--
Carex trisperma	--	--	--	--	--	--	--	--	--	--	--	--
Chrysoplenium iowense	--	--	--	--	--	--	--	--	--	--	--	--
Cinna latifolia	--	--	--	--	--	--	--	--	--	--	--	19
Circaea alpina	--	--	--	--	--	--	--	--	--	--	--	--
Cirsium foliosum	--	--	--	--	--	--	--	--	--	.5	--	--
Coptis trifolia	.5	.5	--	--	--	--	--	--	--	--	--	--
Cornus canadensis	06	25	.5	05	--	--	--	--	05	--	11	--
Cystopteris fragilis	--	--	--	--	--	--	--	--	--	--	--	--
Delphinium glaucum	--	--	--	--	--	--	--	--	--	02	--	10
Drosera anglica	--	--	--	--	--	03	03	--	--	--	--	--
Dryopteris spinulosa	--	--	--	--	--	--	--	--	--	--	01	--
Empetrum nigrum	--	--	02	09	--	--	--	--	.5	--	--	--
Epilobium angustifolium	--	--	--	.5	--	--	--	--	--	03	01	04
Epilobium glandulosum	--	--	--	--	--	--	--	--	--	--	--	--
Epilobium palustre	--	--	--	--	--	--	--	--	--	--	--	--
Equisetum arvense	--	--	--	.5	--	--	--	--	--	--	--	01
Equisetum fluviatile	--	--	--	--	--	--	--	--	--	--	--	--

Equisetum pratense	--	--	--	--	--	--	--	--	--	--	--	--
Equisetum scirpoides	--	--	--	--	--	--	--	--	--	--	--	--
Equisetum sylvaticum	--	--	.5	01	--	--	--	--	.5	--	--	05
Equisetum variegatum	--	--	--	--	--	.5	--	--	--	--	--	--
Eriophorum angustifolium	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum brachyantherum	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum chamissonis	--	--	--	--	--	--	--	--	--	--	--	--
Eriophorum sp.	--	--	--	--	--	--	--	.5	--	--	--	--
Eriophorum vaginatum	--	--	--	--	--	--	--	--	--	--	--	--
Fragaria virginiana	--	--	--	--	--	--	--	--	--	04	--	--
Galium boreale	--	--	--	--	--	--	--	--	--	.5	--	--
Galium triflorum	--	--	--	--	--	--	--	--	--	--	--	03
Gaultheria hispidula	--	--	02	09	--	--	--	--	04	--	--	--
Geocaulon lividum	--	--	--	.5	--	--	--	--	--	--	--	--
Geranium nervosum	--	--	--	--	--	--	--	--	--	--	--	--
Geranium richardsonii	--	--	--	--	--	--	--	--	--	--	--	--
Geum macrophyllum	--	--	--	--	--	--	--	--	--	10	--	--
Geum rivale	--	--	--	--	--	--	--	--	--	--	--	--
Glyceria borealis	--	--	--	--	--	--	--	--	--	--	--	--
Gymnocarpium dryopteris	--	--	--	--	--	--	--	--	--	--	--	--
Heracleum lanatum	--	--	--	--	--	--	--	--	--	--	--	--
Hieracium gracile	--	--	--	--	--	--	--	--	--	--	--	--
Impatiens sp.	--	--	--	--	--	--	--	--	--	--	--	--
Juncus albescens	--	--	--	--	--	--	02	--	--	--	--	--
Juncus stygius	--	--	--	--	--	02	--	--	--	--	--	--
Kalmia polifolia	--	--	.5	01	03	--	--	.5	--	--	--	--
Lathyrus ochroleucus	--	--	--	--	--	--	--	--	--	.5	--	--
Ledum groenlandicum	--	--	40	--	--	--	--	--	--	--	07	--
Linnaea borealis	.5	02	--	--	--	--	--	--	--	--	--	--
Listera borealis	--	--	--	--	--	--	--	--	--	--	--	--
Listera cordata	--	.5	--	--	--	--	--	--	--	--	--	--
Luzula parviflora	--	--	--	--	--	--	--	--	--	--	.5	--
Lycopodium annotinum	15	05	--	--	--	--	--	--	--	--	04	--
Lycopodium complanatum	--	--	--	--	--	--	--	--	--	--	--	--
Maianthemum canadense	--	.5	--	--	--	--	--	--	--	--	--	--
Menyanthes trifoliata	--	--	--	--	--	45	05	.5	--	--	--	--
Mertensia paniculata	--	--	--	--	--	--	--	--	--	02	--	03
Mitella nuda	--	--	--	--	--	--	--	--	--	--	--	.5
Moneses uniflora	--	--	--	--	--	--	--	--	--	--	--	--
Oryzopsis asperifolia	--	--	--	--	--	--	--	--	--	--	--	--
Osmorhiza depauperata	--	--	--	--	--	--	--	--	--	--	--	--
Osmorhiza sp.	--	--	--	--	--	--	--	--	--	--	--	01
Oxycoccus microcarpus	--	--	.5	01	--	--	--	.5	--	--	--	--
Parnassia palustris	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis groenlandica	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis labradorica	--	--	--	--	--	--	--	--	--	--	--	--
Pedicularis sp.	--	--	--	.5	--	--	--	--	--	--	--	--
Penstemon procerus	--	--	--	--	--	--	--	--	--	03	--	--
Petasites palmatus	--	.5	--	.5	--	--	--	--	--	01	--	01
Phleum alpinum	--	--	--	--	--	--	--	--	--	.5	--	--
Picea complex	.5	--	--	--	--	--	--	--	--	--	--	--
Picea mariana	--	--	02	05	02	--	--	--	--	--	--	--
Pinus contorta	.5	--	--	--	--	--	--	--	--	--	--	--
Poa pratensis	--	--	--	--	--	--	--	--	--	.5	--	--
Potentilla palustris	--	--	--	--	--	--	--	--	--	--	--	--
Pyrola asarifolia	--	--	--	--	--	--	--	--	--	--	--	--
Pyrola minor	--	--	--	--	--	--	--	--	--	--	--	--
Pyrola secunda	.5	.5	--	--	--	--	--	--	--	--	--	.5
Ranunculus lapponicus	--	--	--	--	--	--	--	--	--	--	--	--
Ribes glandulosum	.5	--	--	--	--	--	--	--	--	--	.5	--

Ribes lacustre	.5	--	--	--	--	--	--	--	--	--	--	01
Ribes laxiflorum	--	--	--	--	--	--	--	--	--	--	--	01
Rosa acicularis	--	--	--	--	--	--	--	--	--	--	--	--
Rubus acaulis	--	--	--	--	--	--	--	--	--	--	--	--
Rubus chamaemorus	--	--	03	--	05	--	--	--	--	--	--	--
Rubus pedatus	35	35	.5	.5	--	--	--	--	02	--	06	--
Rubus pubescens	--	--	--	--	--	--	--	--	--	--	--	01
Rubus strigosus	.5	--	--	--	--	--	--	--	--	--	--	05
Rumex occidentalis	--	--	--	--	--	--	--	--	--	01	--	--
Rumex sp.	--	--	--	--	--	--	--	--	--	--	--	--
Salix pedicellaris	--	--	--	--	--	--	--	08	--	--	--	--
Salix pyrifolia	--	--	--	--	--	--	--	--	--	--	--	--
Sambucus sp.	--	--	--	--	--	--	--	--	--	--	--	--
Scheuchzeria palustris	--	--	--	--	--	--	--	--	--	--	--	--
Schizachne purpurascens	--	--	--	--	--	--	--	--	--	--	--	--
Senecio triangularis	--	--	--	--	--	--	--	--	--	--	--	--
Smilacina racemosa	--	--	--	--	--	--	--	--	--	--	--	--
Smilacina stellata	--	--	--	--	--	--	--	--	--	--	--	--
Smilacina trifolia	--	--	--	--	02	--	--	.5	--	--	--	--
Solidago gigantea	--	--	--	--	--	--	--	--	--	03	--	--
Sorbus sitchensis	--	--	--	--	--	--	--	--	--	--	--	--
Sorbus sp.	03	.5	--	--	--	--	--	--	.5	--	--	--
Sparganium hyperboreum	--	--	--	--	--	--	--	--	--	--	--	--
Spiranthes romanzoffiana	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria calycantha	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria crispa	--	--	--	--	--	--	--	--	--	--	--	--
Stellaria longifolia	--	--	--	--	--	--	--	--	--	--	--	--
Streptopus amplexifolius	.5	01	--	--	--	--	--	--	--	--	--	02
Thalictrum occidentale	--	--	--	--	--	--	--	--	--	--	--	--
Thalictrum sparsiflorum	--	--	--	--	--	--	--	--	--	--	--	--
Thalictrum venulosum	--	--	--	--	--	--	--	--	--	06	--	--
Tiarella trifoliata	--	.5	--	--	--	--	--	--	--	--	.5	--
Trientalis borealis	--	--	--	--	--	--	--	--	--	--	--	--
Trisetum spicatum	--	--	--	--	--	--	--	--	--	--	--	--
Urtica gracilis	--	--	--	--	--	--	--	--	--	--	--	--
Vaccinium caespitosum	--	--	--	01	--	--	--	--	--	--	--	--
Vaccinium membranaceum	12	02	15	05	--	--	--	--	06	--	03	--
Vaccinium myrtilloides	12	--	15	03	--	--	--	--	05	--	--	--
Vaccinium vitis-idaea	--	--	02	05	03	--	--	--	03	--	--	--
Veronica americana	--	--	--	--	--	--	--	--	--	--	--	--
Viburnum edule	--	--	--	--	--	--	--	--	--	--	--	02
Vicia americana	--	--	--	--	--	--	--	--	--	.5	--	--
Viola palustris	--	--	--	--	--	--	--	--	--	--	--	--
Viola renifolia	--	--	--	--	--	--	--	--	--	--	--	--
Viola sp.	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	85	77	85	45	50	60	55	70	75	95	35	95

LAYER NUMBER 6: BRYOID 63 SPECIES PART 1 OF 4

VEGETATION PLOT NUMBER	CB83 001	CB83 002	CB83 003	CB83 004	CB83 005	CB83 006	CB83 007	CB83 009	CB83 010	CB83 011	CB83 013	CB83 014	CB83 015	CB83 016	CB83 017	CB83 018	CB83 019	CB83 021	CB83 022	CB83 023
Alectoria sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--
Aulacomnium palustre	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barbilophozia sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Brachythecium sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Brachythecium starkei	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bryoria fuscescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bryum sp.	.5	--	--	--	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cetraria halei	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cetraria pinastre	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cenotea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia chlorophaea	.5	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cornuta	--	--	.5	--	--	.5	--	.5	--	--	.5	--	--	--	--	--	--	--	--	--
Cladonia cristata	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia deformis	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia gonecha	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia gracilis	--	--	.5	--	--	.5	--	.5	--	--	.5	--	--	--	--	--	--	--	--	--
Cladonia mitis	--	--	.5	--	--	--	.5	--	--	--	10	--	--	.5	--	--	--	--	.5	--
Cladonia rangiferina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dicranum fuscescens	02	--	--	--	--	--	.1	--	--	--	--	--	--	20	--	--	--	--	--	--
Dicranum sp.	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	05	.5	--	--	--	--
Drepanocladus exannulatus	--	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Drepanocladus sp.	--	--	--	--	--	--	--	--	--	--	--	05	.1	--	--	--	--	--	--	10
Evernia mesomorpha	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hylocomium splendens	--	05	--	--	--	25	50	--	--	--	--	--	--	--	--	20	--	--	--	--
Hypogymnia physodes	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Icmadophila ericetorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Larix lyallii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Marchantia polymorpha	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--
Mnium sp.	--	--	--	--	--	--	--	--	.1	--	--	.1	--	--	--	.5	--	--	--	--
Parmelia sulcata	--	.5	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--
Parmeliopsis ambigua	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Parmeliopsis hyperopta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Peltigera aphthosa	--	--	--	--	--	--	--	.5	--	--	05	--	--	.5	--	--	--	--	--	--
Peltigera malacea	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--
Peltigera rufescens	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Plagiomnium medium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05
Plagiomnium sp.	--	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plagiothecium denticulatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plagiothecium sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pleurozium schreberi	15	37	27	--	10	15	30	35	--	20	55	--	--	05	30	--	--	--	50	--
Pohlia nutans	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum commune	--	--	--	--	20	25	.5	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum juniperinum	--	--	08	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--
Polytrichum piliferum	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--
Polytrichum sp.	.5	.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum strictum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ptilidium pulcherrinum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ptilium crista-castrensis	03	08	05	--	--	05	--	45	--	15	--	--	--	50	35	--	--	--	--	--
Rhizomnium pseudopunctatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rhododendron lapponicum	--	--	--	--	--	--	--	--	.1	--	--	--	--	--	--	--	--	--	--	--
Sphagnum angustifolium	--	--	--	10	50	15	--	--	--	--	--	--	25	--	--	--	--	--	--	--
Sphagnum fuscum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum girgensohnii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Sphagnum magellanicum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum nemoreum	--	--	--	--	--	--	--	--	--	50	--	--	--	--	--	--	--	--	--	--
Sphagnum sp.	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	.5	60	50	--	--
Sphagnum squarrosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum teres	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum warnstorfii	--	--	--	--	--	--	--	--	--	--	--	10	--	--	--	--	--	--	--	--
Tomenthypnum falcifolium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Usnea soridifera	--	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Usnea sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--
Usnea subfloridana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	20	50	40	60	80	85	80	80	05	90	70	15	25	75	70	20	60	50	50	15

LAYER NUMBER 6: BRYOID 63 SPECIES PART 2 OF 4

VEGETATION PLOT NUMBER	CB83 024	CB83 025	CB83 026	CB83 027	CB83 028	CB83 030	CB83 031	CB83 032	CB83 033	CB83 034	CB83 036	CB83 037	CB83 038	CB83 039	CB83 040	CB83 041	CB83 042	CB83 043	CB83 044	MF83 001
Alectoria sp.	.5	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Aulacomnium palustre	--	--	--	--	--	10	--	10	--	--	--	--	--	--	--	--	--	--	--	--
Barbilophozia sp.	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--
Brachythecium sp.	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--
Brachythecium starkei	--	--	10	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bryoria fuscescens	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Bryum sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cetraria halei	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Cetraria pinastre	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cenotea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia chlorophaea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cornuta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cristata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia deformis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia gonecha	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia gracilis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia mitis	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	.5	--	--	--	--	--
Cladonia rangiferina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dicranum fuscescens	--	.5	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	.5
Dicranum sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Drepanocladus exannulatus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Drepanocladus sp.	--	--	--	--	--	--	20	--	--	--	--	--	--	15	--	--	05	--	--	--
Evernia mesomorpha	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hylocomium splendens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--
Hypogymnia physodes	--	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Icmadophila ericetorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
Larix lyallii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Marchantia polymorpha	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mnium sp.	--	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--
Parmelia sulcata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Parmeliopsis ambigua	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Parmeliopsis hyperopta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Peltigera aphthosa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Peltigera malacea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Peltigera rufescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plagiomnium medium	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--
Plagiomnium sp.	--	--	--	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--
Plagiothecium denticulatum	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--
Plagiothecium sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--
Pleurozium schreberi	20	--	--	--	35	--	--	--	60	.5	--	35	50	--	15	--	--	03	--	33
Pohlia nutans	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum commune	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum juniperinum	--	--	--	--	--	30	--	--	05	--	--	05	--	--	--	--	--	--	--	02
Polytrichum piliferum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum sp.	--	--	--	--	--	--	--	--	--	--	.1	--	--	--	--	--	--	--	--	--
Polytrichum strictum	--	--	--	--	--	05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ptilidium pulcherrinum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ptilium crista-castrensis	--	--	--	--	15	--	--	--	15	--	--	05	15	--	--	--	--	--	--	.5
Rhizomnium pseudopunctatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rhododendron lapponicum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum angustifolium	--	--	--	--	--	--	--	65	--	--	65	20	--	30	--	--	--	--	--	--
Sphagnum fuscum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum girgensohnii	--	--	--	--	--	--	--	--	--	--	--	05	--	--	--	--	--	--	--	--

Sphagnum magellanicum	--	--	--	--	--	--	--	10	--	--	05	--	--	15	--	--	--	--	--	--
Sphagnum nemoreum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum sp.	--	--	--	--	--	40	70	--	--	--	--	--	05	--	--	80	70	55	--	--
Sphagnum squarrosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13	--	--	--	--	--
Sphagnum teres	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12	--	--	--	--	--
Sphagnum warnstorfii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tomenthypnum falcifolium	--	--	--	--	--	--	--	--	--	--	.5	.5	--	--	--	--	--	--	--	--
Usnea soridifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Usnea sp.	.5	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--
Usnea subfloridana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	20	10	10	10	50	85	90	95	80	10	75	70	70	60	40	80	75	60		35

LAYER NUMBER 6: BRYOID 63 SPECIES PART 3 OF 4

VEGETATION PLOT NUMBER	MF83 002	MF83 004	MF83 005	MF83 006	MF83 007	MF83 008	MF83 009	MF83 010	MF83 011	MF83 012	MF83 013	MF83 015	MF83 016	MF83 017	MF83 018	MF83 020	MF83 021	MF83 023	MF83 024	MF83 025
Alectoria sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aulacomnium palustre	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	--
Barbilophozia sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Brachythecium sp.	--	--	--	--	--	--	--	02	--	--	--	--	--	--	--	--	--	--	--	--
Brachythecium starkei	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bryoria fuscescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.1	--	--	--
Bryum sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cetraria halei	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Cetraria pinastre	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Cladonia cenotea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia chlorophaea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cornuta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cristata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia deformis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia gonecha	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--
Cladonia gracilis	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia mitis	--	.5	--	--	--	--	--	--	--	--	--	01	--	--	.5	--	--	--	--	--
Cladonia rangiferina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5
Dicranum fuscescens	--	--	--	--	--	04	--	--	--	--	--	--	--	--	--	--	--	07	--	--
Dicranum sp.	--	02	--	--	05	--	--	--	02	--	--	--	--	--	--	--	--	--	--	--
Drepanocladus exannulatus	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Drepanocladus sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Evernia mesomorpha	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hylocomium splendens	--	--	--	--	01	--	--	--	.5	--	--	--	--	--	--	--	--	05	--	--
Hypogymnia physodes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Icmadophila ericetorum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Larix lyallii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Marchantia polymorpha	--	--	--	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
Mnium sp.	.5	--	--	--	--	--	--	--	--	01	--	.5	--	--	--	--	--	--	--	--
Parmelia sulcata	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Parmeliopsis ambigua	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Parmeliopsis hyperopta	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--	--
Peltigera aphthosa	--	--	--	--	.5	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--
Peltigera malacea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Peltigera rufescens	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plagiomnium medium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plagiomnium sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plagiothecium denticulatum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plagiothecium sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pleurozium schreberi	--	20	23	--	38	05	02	--	19	02	25	47	--	--	20	--	--	55	--	30
Pohlia nutans	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum commune	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum juniperinum	--	05	--	--	03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10
Polytrichum piliferum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum sp.	--	--	--	--	--	--	--	--	--	--	--	02	--	--	07	--	--	--	--	--
Polytrichum strictum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--
Ptilidium pulcherrinum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--
Ptilium crista-castrensis	--	08	07	--	38	06	03	--	19	02	10	08	--	--	01	--	--	20	--	05
Rhizomnium pseudopunctatum	--	--	--	--	--	--	--	03	--	--	--	--	--	--	--	--	--	--	--	--
Rhododendron lapponicum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum angustifolium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	40	--	50	--	24	35
Sphagnum fuscum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	04	--
Sphagnum girgensohnii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	03	--	--

Sphagnum magellanicum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	10	10
Sphagnum nemoreum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum sp.	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	--	--	--	--	--
Sphagnum squarrosum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum teres	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum warnstorfii	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tomenthypnum falcifolium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	--
Usnea soridifera	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--
Usnea sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.1	--	--	--
Usnea subfloridana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.5	--	--
TOTAL	.5	35	30	0	85	15	05	05	40	05	35	60	.5	.5	70	.5	50	90	60	90

LAYER NUMBER 6: BRYOID 63 SPECIES PART 4 OF 4

VEGETATION PLOT NUMBER	MF83 026	MF83 027	MF83 028	MF83 029	MF83 030	MF83 031	MF83 131	MF83 231	MF83 032	MF83 033	MF83 034	MF83 035
Alectoria sp.	--	--	--	--	--	--	--	--	--	--	--	--
Aulacomnium palustre	--	--	--	--	--	--	--	--	--	--	--	--
Barbilophozia sp.	--	--	--	--	--	--	--	--	--	--	--	--
Brachythecium sp.	--	--	--	--	--	--	--	--	--	--	--	--
Brachythecium starkei	--	--	--	--	--	--	--	--	--	--	--	--
Bryoria fuscescens	--	--	--	--	--	--	--	--	--	--	--	--
Bryum sp.	--	--	--	--	--	--	--	--	--	--	--	--
Cetraria halei	--	--	--	--	--	--	--	--	--	--	--	--
Cetraria pinastre	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cenotea	--	--	--	.5	--	--	--	--	--	--	--	--
Cladonia chlorophaea	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia cornuta	--	--	--	.5	--	--	--	--	--	--	--	--
Cladonia cristata	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia deformis	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia gonecha	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia gracilis	--	--	--	--	--	--	--	--	--	--	--	--
Cladonia mitis	--	--	--	02	--	--	--	--	--	--	--	--
Cladonia rangiferina	--	--	--	02	--	--	--	--	--	--	--	--
Dicranum fuscescens	--	--	--	--	--	--	--	--	--	--	--	--
Dicranum sp.	--	--	--	01	--	--	--	--	--	--	--	--
Drepanocladus exannulatus	--	--	--	--	--	--	--	--	--	--	--	--
Drepanocladus sp.	--	--	--	--	--	19	--	--	--	--	--	--
Evernia mesomorpha	--	--	--	--	--	--	--	--	--	--	--	--
Hylocomium splendens	--	--	--	08	--	--	--	--	10	--	--	--
Hypogymnia physodes	--	--	--	--	--	--	--	--	--	--	--	--
Icmadophila ericetorum	--	--	--	02	--	--	--	--	--	--	--	--
Larix lyallii	--	--	--	--	--	--	--	--	50	--	--	--
Marchantia polymorpha	--	--	--	--	--	--	--	--	--	--	--	--
Mnium sp.	--	--	--	--	--	--	--	--	--	--	--	--
Parmelia sulcata	--	--	--	--	--	--	--	--	--	--	--	--
Parmeliopsis ambigua	--	--	--	--	--	--	--	--	--	--	--	--
Parmeliopsis hyperopta	--	--	--	--	--	--	--	--	--	--	--	--
Peltigera aphthosa	--	--	.5	--	--	--	--	--	.5	--	--	--
Peltigera malacea	--	--	--	--	--	--	--	--	--	--	--	--
Peltigera rufescens	--	--	--	.5	--	--	--	--	--	--	--	--
Plagiomnium medium	--	--	--	--	--	--	--	--	--	--	--	--
Plagiomnium sp.	--	--	--	--	--	--	--	--	--	--	--	--
Plagiothecium denticulatum	--	--	--	--	--	--	--	--	--	--	--	--
Plagiothecium sp.	--	--	--	--	--	--	--	--	--	--	--	--
Pleurozium schreberi	75	78	60	58	25	--	--	--	25	--	65	--
Pohlia nutans	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum commune	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum juniperinum	05	04	05	--	--	--	--	--	.5	03	--	--
Polytrichum piliferum	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum sp.	--	--	--	--	--	--	--	--	--	--	--	--
Polytrichum strictum	--	--	--	--	--	--	--	--	--	--	--	--
Ptilidium pulcherrinum	--	--	--	--	--	--	--	--	--	--	--	--
Ptilium crista-castrensis	15	11	10	--	--	--	--	--	25	--	18	--
Rhizomnium pseudopunctatum	--	--	--	--	--	--	--	--	--	--	--	--
Rhododendron lapponicum	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum angustifolium	--	--	--	--	05	--	--	--	--	--	--	--
Sphagnum fuscum	--	--	--	22	--	--	--	--	--	--	--	--
Sphagnum girgensohnii	--	--	--	--	--	--	--	60	--	--	--	--

Sphagnum magellanicum	--	--	--	--	60	--	50	--	--	--	--	--
Sphagnum nemoreum	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum sp.	--	--	20	--	--	80	--	--	30	--	--	--
Sphagnum squarrosum	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum teres	--	--	--	--	--	--	--	--	--	--	--	--
Sphagnum warnstorfii	--	--	--	--	--	--	--	--	--	--	--	--
Tomenthypnum falcifolium	--	--	--	--	--	--	--	--	--	--	--	--
Usnea soridifera	--	--	--	--	--	--	--	--	--	--	--	--
Usnea sp.	--	--	--	--	--	--	--	--	--	--	--	--
Usnea subfloridana	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	95	93	95	95	90	99	50	60	90	03	98	.5